Products finishing

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CONTENTS

Finishing Dayton Pumps 9
By FRED W. VOGEL

Cleaning and Painting Automobile Frames at Budd Plant....18
By C. C. HERMANN

Barrel Finishing of Metal Products.....24
By H. LEROY BEAVER

Paint Mixture Control by the Viscosity Method.....30
By E. A. ZAHN

Unusual Application Extends Field of Porcelain Enameling...38

The Finishing Forum—

Fixture for Making a Damascene Finish on a Polished Metal Surface 42
By JOE COWLES

Spot Test for Reducers.....42
By W. G. SHEANE

Practical Plating Suggestions.....44
By EDWARD FINNIE

Finishes That Aid in Appearance and Utility.....46
News of the Industry.....48
New Plant Equipment and Materials.....52
Opportunity Section 61
For Your Catalog Library.....62
Index to Advertisements 64

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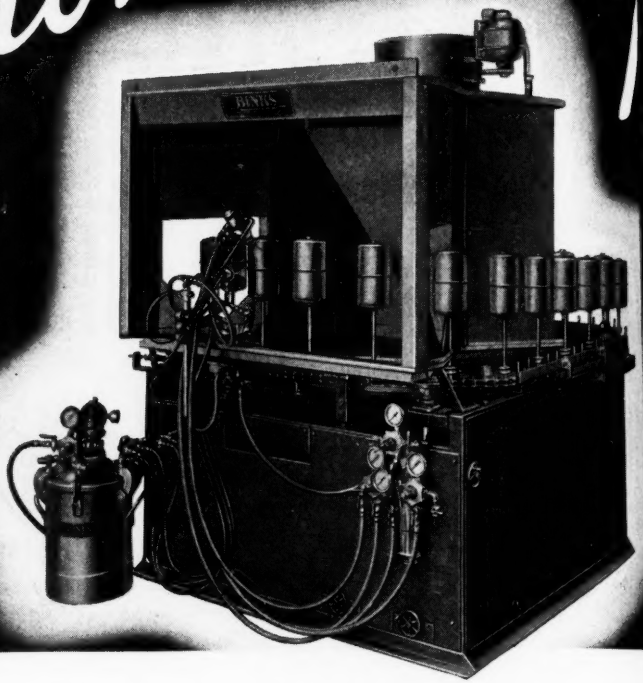

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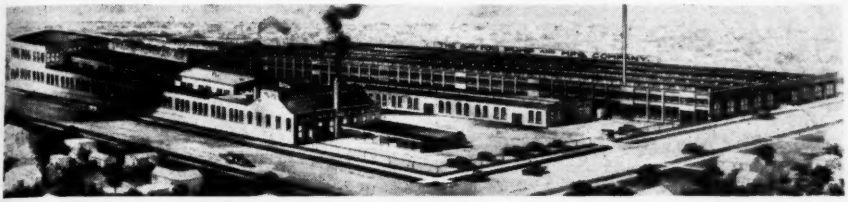


FINISHING DAYTON PUMPS

Both sales appeal and protection against corrosion and other natural forces are important factors in the finishing of pumps and pumping equipment.

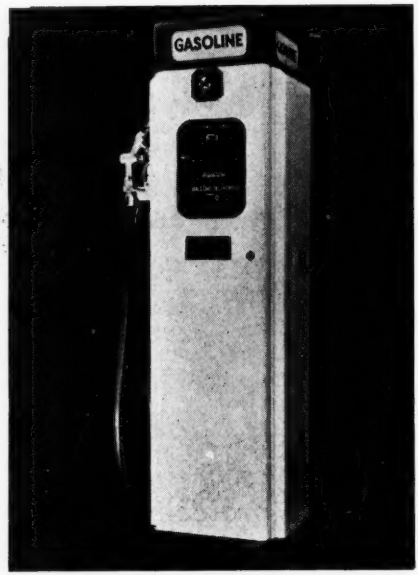
By FRED W. VOGEL

ONE of the important industries in the United States is the manufacture of equipment for transferring liquids such as water and gasoline from one place to another. Such equipment is usually highly specialized in application and requires a high degree of engineering skill and ingenuity in fabrication and finishing.

Careful consideration must be given to the physical characteristics, behavior, and amount of liquid, and the time allotted for transferring that material. In the case of gasoline transference equipment, special recording devices are required for computating the amount, while in transferring water, the most important factors are distance and pressure.

One of the pioneer manufacturers of liquid pumping and handling equipment in this country is The Dayton Pump & Manufacturing Company, Dayton, Ohio. The water pumping systems manufactured by this firm are used in suburban homes and on

farms that are located beyond a city's water supply. The gasoline pumps are used in service stations wherever gasoline is dispensed. In either case, the pumps are visible to the eye and therefore require finishes and contours that are pleasing. The contour and finish must be attractively styled in order to offer as much sales appeal as possible. At the Dayton Pump plant, the two types of pumps referred to are manufactured in separate departments and the finishing process employed in these departments on the pumps and accessory equipment are described in the following article.



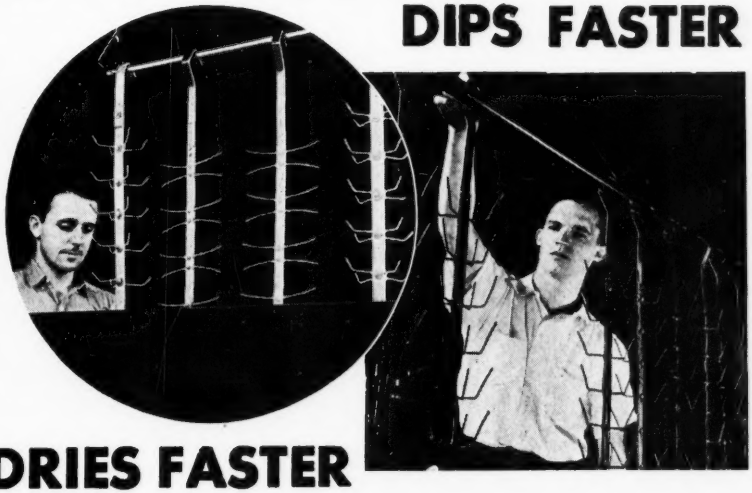
Satisfactory finishes on pumping equipment are assured through the application of the modern equipment described in this article.

Maximum cleanliness of all parts to which a finishing material is to be applied insures a satisfactory finish at a minimum cost. To obtain this cleanliness, the tanks of cleaning solution shown in Fig. 1 are provided. The operator is shown here lowering a wire mesh basket containing motor mount castings into the cleaning tank. These pieces are U-shaped and of such a size that 10 can conveniently be placed in a wire basket. The wire basket itself is 18 in. wide and 24 in. long.

Vapors which rise from the hot cleaning solution are drawn off through a long inverted trough exhaust hood which covers the entire width and length of the tank. As shown in the illustration, the cleaning setup consists of two tanks located side by side. The tank at the left contains the cleaning solution and the tank at the right contains hot, clear water for rinsing purposes. The tanks are fabricated from a good grade of cold steel and each is 8 ft. long, 30 in. wide, and 3 ft. high. The pieces being cleaned remain in the cleaning solution for a period of two minutes, after which they are removed and rinsed in clear hot water. Both of the tanks are steel jacketed and the solutions are maintained at the boiling point to insure thorough removal of greases or drawing compounds which accumulate on the parts during fabrication.

After the parts are thoroughly cleaned and dried, they are placed in tote boxes and conveyed to the pump assembly line. Inasmuch as only one prime color is used, the parts that go into the complete assembly are not finished individually, but rather as a complete unit. The assembled pump is thoroughly wiped before it is moved into the DeVilbiss spray booth shown in Fig. 2, where an air dry lacquer is applied. The pump shown in this illustration is known as

The Plating Rack Coating That DIPS FASTER



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the Dayton Cub DeLuxe Shallow Well-Type House Pump.

The booth is equipped with small doors on each side and an assembly conveyor runs directly through the center of the booth, thus permitting the assembled pumps to enter one side of the booth, receive the lacquer coating, and pass out through the opposite side. At the center of the booth is a revolving section of the long assembly roller conveyor table which serves as a turntable. The openings on the opposite sides of the spray booths are closed during the spraying operation, thus providing the same complete booth enclosure found in the conventional type of spray booth.

The water pump shown in an operating position in Fig. 3 is a Dayton Deep Well Pump for suburban home and farm use. Inasmuch as the booth shown in the illustration is of the "dry" type, an adequate exhaust system is provided at the rear to draw off excess spray and fumes.

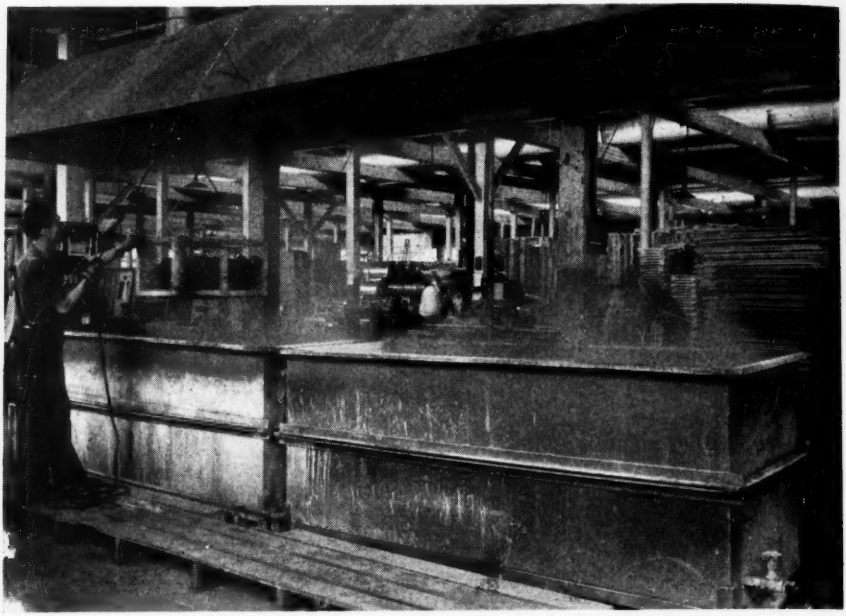

Fig. 1—A view of the cleaning tanks in which pump parts are immersed for complete removal of oil and grease prior to assembly and finishing.

The smooth and lustrous finishes for the cabinets that house the gasoline pumps are applied by the operator shown in Fig. 4. Panels of the pump cabinets are finished individually in a dustproof room and then are placed on trucks and conveyed to a baking oven. A view of the Kirk & Blum fully-enclosed baking oven in which the panels are baked is shown in Fig. 5. This oven is compactly designed, being built in two sections. The dual sections provide a means for loading

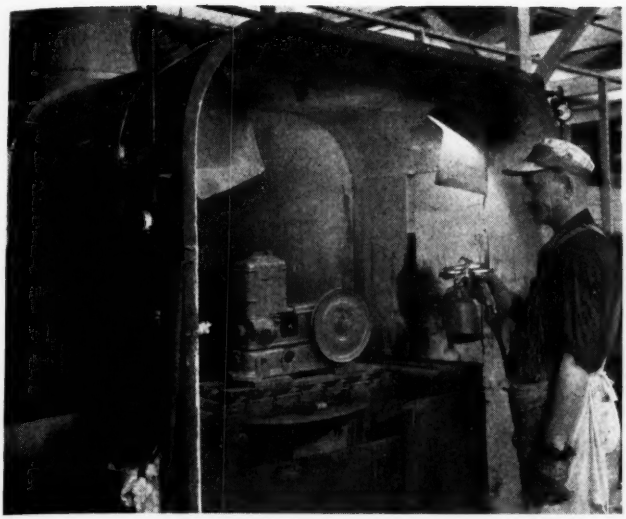

Fig. 2 — A special turntable on which the pumps are located during the spraying operation is part of the continuous assembly conveyor.

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one side while the other side is closed and operating. Approximately 500 lbs. of work is handled in this oven per charge.

The oven is 9 ft. deep, 12 ft. wide, and 7 ft. 8 in. high—which is adequate to accommodate two trucks. A recirculating fan on top of the oven pulls in fresh air and mixes it with the heated oven air. The temperature of the oven is maintained at 270 deg. and at this temperature, the workpieces bake thoroughly in 40 min. A constant temperature is automatically maintained by means of a Wheelco Capacitrol heat control device. The heat for the oven is provided through a direct blast type air heater.

In addition to the pumps which they manufacture, the Dayton Pump & Manufacturing Company also makes auxiliary equipment such as tanks for both water and gasoline storage purposes. Most of the tanks are of sheet steel and most are galvanized after fabrication. The tanks are, however, pickled prior to galvanizing, the pickling department being located adjacent to the galvanizing department. The pickling department is shown in Fig. 6. The pickling tank is of brick and is lined

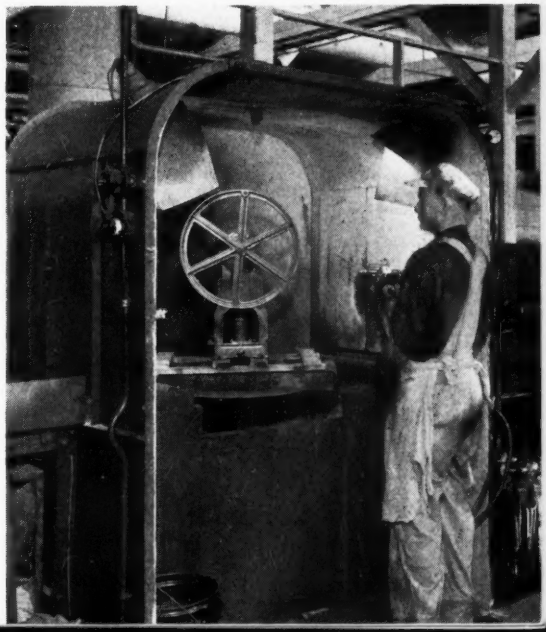
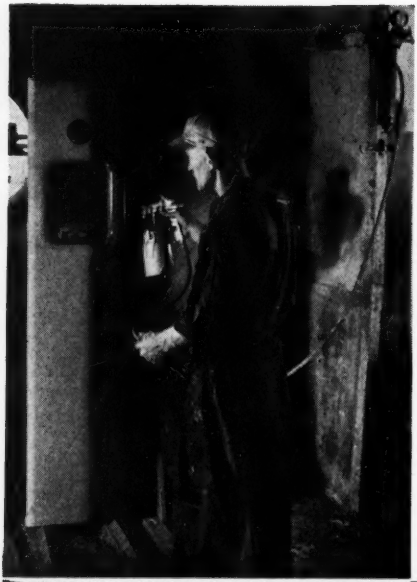


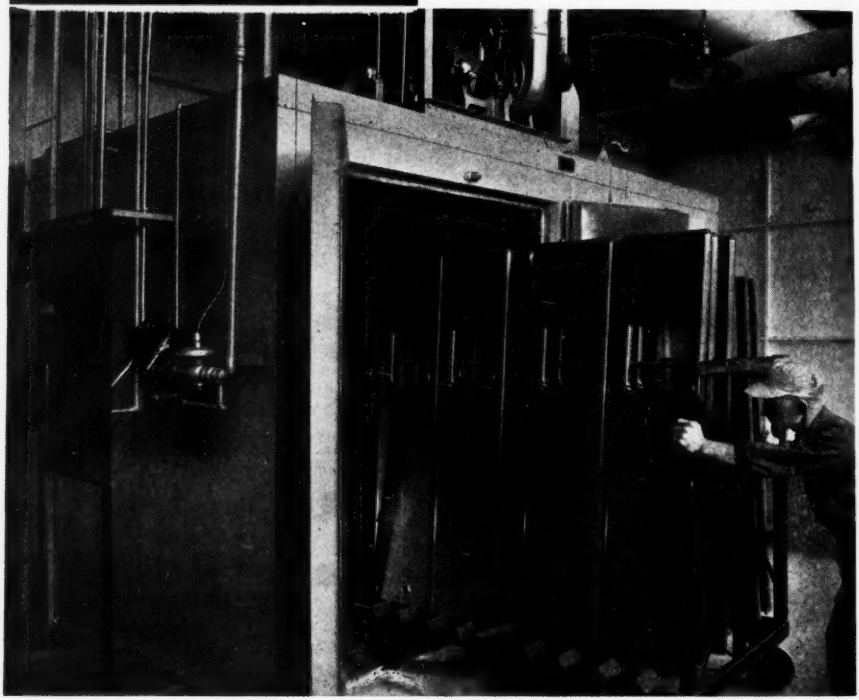
Fig. 3—Excess spray is carried away through the large exhaust system located at the rear of the booth.

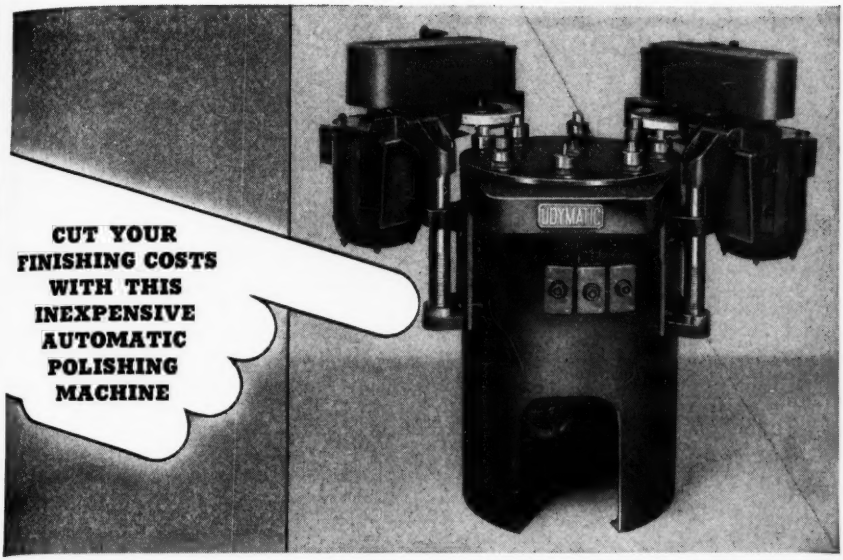


with a sheet of rubber of approximately ¼ in. thickness. The pickling solution consists of sulphuric acid which is heated to 200 deg. F. by means of two steam coils, one located at each end of the tank. The tanks shown being lifted out of the pickling tank by the operator have been subjected to the hot pickling solution for approximately 15 minutes, during which scale, rust, and oil have

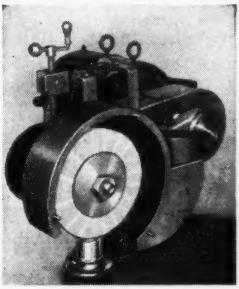
Fig. 4 (Left)—Adequate lighting and sufficient ventilation help this operator to obtain smooth and lustrous finishes on gasoline pump housing panels.

Fig. 5 (Below)—The construction of an oven that is properly engineered will bake finishing materials in a minimum of time.





FINISHES UP TO 1400 PIECES PER HOUR WITH ONE OPERATOR . . .



Close up of polishing head showing wheel in vertical position finishing top of work.

The small automatic polishing and buffing machine shown in the illustration is ideally adapted to the production finishing of small parts (such as door knobs, vanity cases, lip stick containers, thermos bottle caps, etc.). It is a unit designed to reduce manual handling and finishing cost to an absolute minimum. Efficient, sturdily built and inexpensive, it has all the features of much larger equipment at a price well within the average budget.

The production capacity is high. Up to 1400 pieces per hour can be polished and buffed.

One operator only is required to load and unload the work.

The machine can be used for a number of different classes of work. The index rate can be varied between wide limits and the wheels are adjustable to any angle, thus making the unit readily adaptable to a variety of requirements.

Simply and sturdily built, the small automatic is easy to operate and previous experience with automatic equipment is not necessary to obtain perfect results.

The machine is equipped with two or more full floating, adjustable polishing heads. Angle of work contact from vertical to horizontal can be secured by a few turns of a screw. Work pressures can be varied to suit polishing, buffing or coloring operations.

If you now hand polish or buff a variety of small parts, it will pay you to investigate Udylite automatic finishing equipment. Without any obligation on your part, send us a few samples of your work together with production figures. Our engineers will gladly analyze your finishing problem and submit recommendations.

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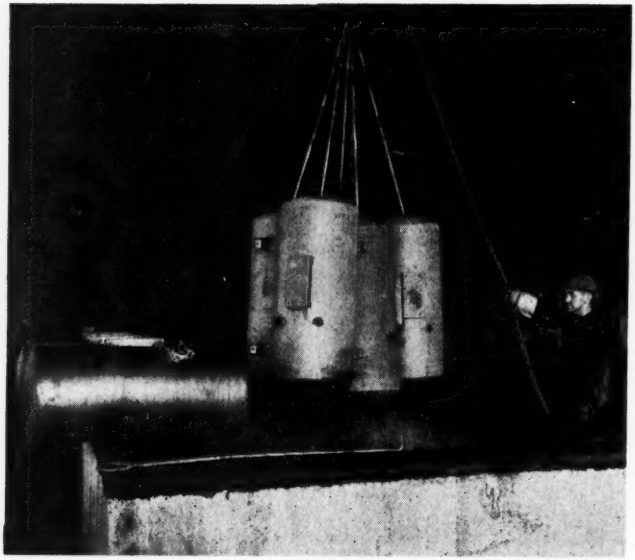

Fig. 6—The operator is removing several pickled tanks from the hot sulphuric acid solution.

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been removed. The tanks shown in the horizontal position on the rear of the pickling tank are ready for immersion in the pickling solution.

From the pickling solution, the tanks are transferred to the galvanizing department which is shown in Figs. 7 and 8. As the tanks are submerged in the molten metal at one end of the large galvanizing tank, the metal flows into the tanks. Following the complete immersion, the tanks are pulled to the opposite end where they are raised with grappling hooks. Fig. 7 shows a view of a grappling hook in position just prior to the removal of the tank. Fig. 8, which is a sequence of Fig. 7, shows the tanks completely out of the molten metal. At this point, the molten metal is permitted to drain back into the original tank. There is little loss of material in the application of this corrosion-resistant coating providing the metal is kept in the molten state and not allowed to solid-

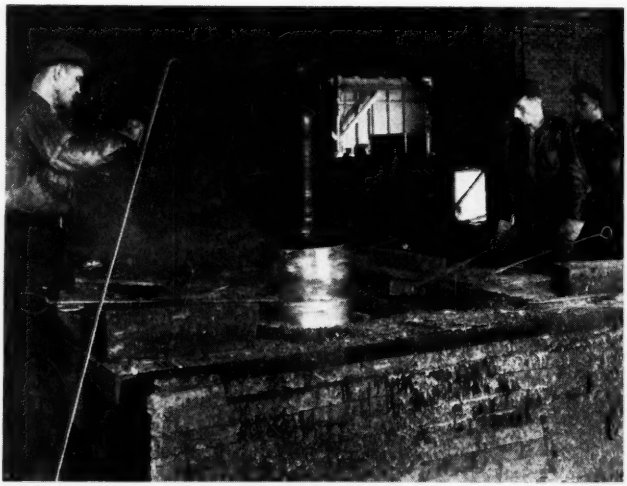

Fig. 7 — The workmen are removing a tank from the molten metal by means of grappling hooks and an overhead hoist.

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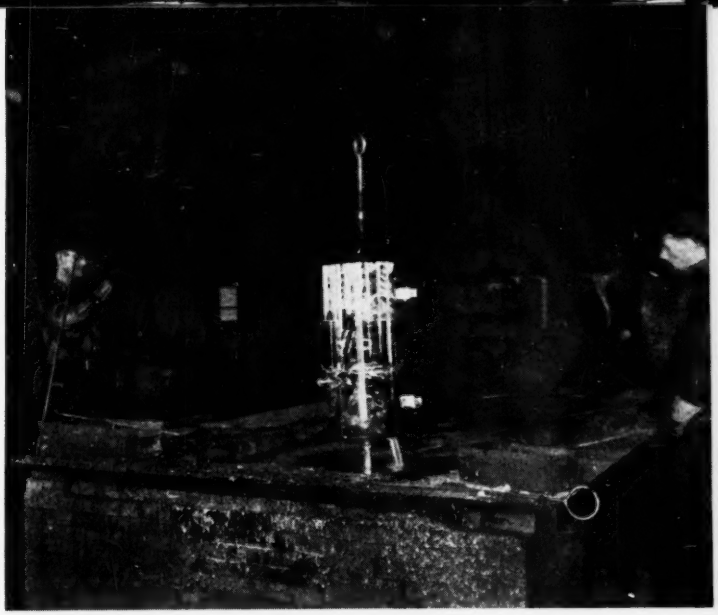

Fig. 8 — The molten metal drains from the tank as it remains suspended over the galvanizing tank.

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ify. After all of the surplus molten metal has drained from the tanks, they are set aside and when sufficiently cool, are carefully inspected to see that the entire surface of each tank, both inside and out, is completely coated.

Cadalyte Bright Dip. The Electroplating Division of E. I. du Pont de Nemours & Company, Wilmington, Del., has just issued a technical service manual giving data on the preparation and use of Cadalyte Bright Dip in cadmium plating. The bulletin describes what Cadalyte Bright Dip does, the procedure for its use, the preparation of the solution, the operation, and the advantages claimed for it. It is stated that cadmium may now be deposited in a brilliant form directly from Cadalyte 39 plating solutions, consequently it is seldom necessary to use a bright dip for brightening purposes alone, as is common practice in many other electroplating processes. There are, however, it is stated, other properties of the deposits pertinent to cadmium that can be improved by subsequent treatment which make the use of a bright dip advantageous in many cases.

The manual points out that Cadalyte Bright Dip was developed to provide a final treatment which would improve the properties of cadmium deposits and obtain also the greatest brightness and uniformity of appearance.

Copies of this technical service manual can be had on application to the Electroplating Division of E. I. du Pont de Nemours & Company, Wilmington, Delaware.

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CLEANING AND PAINTING AUTOMOBILE FRAMES AT BUDD PLANT

In this article, the author tells how the Budd frame finishing department is planned to synchronize production with manufacturing.

By C. C. HERMANN

AN important operation in the mass production of automobile frames at the plant of Edw. G. Budd Manufacturing Company, located at Philadelphia, Pa., involves the cleaning and painting of the parts. The frames are partly assembled from parts which come direct from the forming presses. A continuous trolley conveyor circles the press department and passes through the cleaning, painting and drying oven. The frame parts are hung on this conveyor on hooks placed 18 in. apart. During the forming operations, the parts are coated with heavy drawing compound, grease and dirt which must be thoroughly removed prior to painting.

The conveyor has two speeds, the lower being 6.6 ft. per minute and the higher being 9 ft. per minute. At the lower speed the conveyor capacity is 1,500 lbs. of work per minute and at the higher speed it is 2,200 lbs. per minute. The time required for the work to travel through the cycle is 1 hour and 5 minutes, involving a total distance of 430 feet. The cleaning and painting equipment is made up of sections as follows: 1st, the wash section approximately 8 ft. long; 2nd, the rinse section 10 ft. long; and 3rd, a second rinse section 10 ft. long. Between the two rinse sections there is a vacant space or separator section 8 ft. long. There is also a dry-off section 20 ft. long, followed by the painting and drying section. The cross section of the equipment is 8 ft. wide by 20 ft. high. The wash section is provided with eight rows of spray heads with 15 heads in each row.

The liquid pressure system for the cleaning section consists of a single stage, 6-in. Goulds centrifugal pump direct connected to a 25 h.p., 900 r.p.m., 440 volt, 3 phase, 60 cycle electric motor of the totally inclosed, fan cooled type. The water pressure is maintained on the system at 25 lbs. per sq. in. The temperature of the solution is maintained at 180 deg. F. by emersion steam coils in the 2,200-gal. tank and by the use of a heat exchanger on the discharge side of the pump.

Shortly after placing the system in operation considerable trouble was experienced with lint plugging the spray heads. In the handling of the stock with the use of gloves, sufficient lint would be picked up by the shear edges and subsequently washed off in the washer to plug the nozzles. This problem was solved by the installation of a Cuno Engineering Corporation filter which was placed on the discharge side of the pump. It is now necessary to clean the filter once each week, but no further plugging of the nozzles has been experienced.

In the drawing operation of the steel, a lubricant or drawing compound must be used to eliminate re-stoning of the drawing dies. Without the drawing compound the work would be wrinkled, uneven, twisted and ruined. Therefore, the function of the compound is to provide an even drag on all portions of the work and at the same time provide spacing qualities which prevent direct contact between the work and the die. This latter characteristic of a drawing compound is essential if low cost of dies and low rejection of work is desired. Another desirable characteristic of the drawing compound is that it should readily wash off the work surface. The compound should be free of any toxic effect or infection possibilities and should not corrode the work even though left on the surface for a considerable period of time.

The drawing compound should

Fig. 1—The long automobile frame members are carried into the washing machines shown here by means of a continuous conveyor.

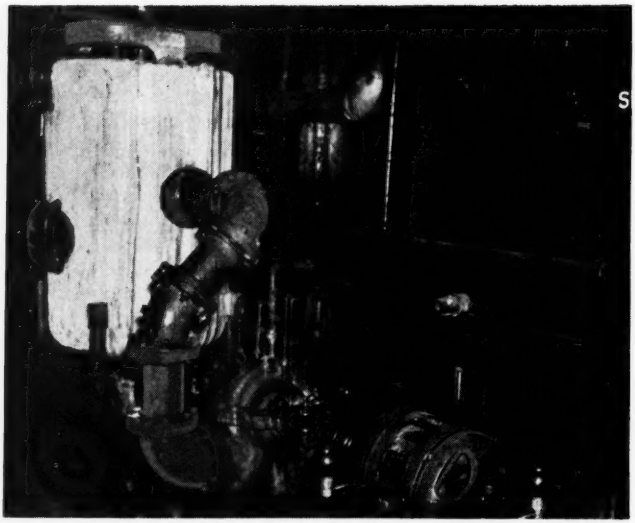

Fig. 2 — A filtering device such as the unit shown here prevents lint and impurities from passing into the spraying nozzles of the washing machine.

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The surface of the metal is left clean following the rinse. For each 7½ hours of operation 150 pounds of cleaner are used, or approximately 3½ pounds of cleaner per ton of material.

have the ability to wet the surface of the work; that is, it must cling to the surface of the metal in the form of a thin film to properly lubricate the surface for the drawing operation. Therefore, when the parts come to the washing operation they are entirely covered with the film of compound.

The washing operation must effectively remove the film of drawing compound. The resulting surface must be free of all grease, oil, fatty substance and dirt to permit a good coverage of the paint without spotting.

At the Budd plant, a Wyandotte SB cleaner is added to the washing water. This is a non-foaming solution, since excessive foaming or sudsing would cause trouble in the pump lines and overflowing of the storage tank. In other words, soap must be left out of the system when mechanical washing is utilized. The solution has the necessary penetrating power to get under the dirt and emulsify the film or bond between the dirt and metal.

The rinsing operation removes the emulsion formed by the washing solution. This rinse is kept at a temperature of 160 deg. F. A draining section in the line of travel permits the excess water to run off before the work enters the second rinse and following this second rinse the work passes into the drying section. The drying section is kept at a temperature of 230 to 250 deg. F., thus insuring a thoroughly dry surface for the paint coat.

The paint applied to the frame parts is an asphalt base gloss paint which is dried at a temperature of 330 deg. F. Following the painting section there is a draining space followed by a drying section. Ample ventilation is provided the drying space to carry off the fumes produced, and at the same time, sufficient fresh air is admitted to maintain a non-hazardous atmosphere in the drying section.

Ventilation is also provided for the washing and rinsing section of the

A DEPENDABLE PRODUCT DESERVES A DEPENDABLE FINISH

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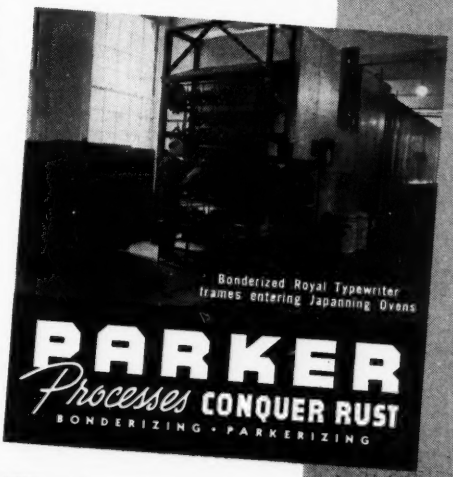

equipment to prevent any fog from coming out into the work space. Consequently, working conditions around the equipment are not affected in the least by the operations. The heating portion of the drying oven is insulated to conserve the heat and a large portion of this is located under the floor, thus permitting the conveyor to double back. In this manner the exit of the work from the final drying section is directly opposite the entrance to the washer.

Maintenance on the equipment has been practically nil for the first year of operation with the exception of the plugging of the spray nozzles which was eliminated by the installation of the filter.

Beaverbright Burnishing Materials Folder. A beautifully illustrated six-page folder describing Beaverbright Metallic Burnishing Materials is now being issued by Beaverbright Division, The Abbott Ball Company, Hartford, Conn. The formed pieces which are designated as Pebs, Balcones, Finbals, Ovalbals, Diagonals and Diamonstels were developed through the continuous research of H. Leroy Beaver, which has covered a period of 30 years, and all of the materials are made to his definite specifications.

The entire line of Beaverbright formed pieces is corelative in that one shape may do all that is required or it may require two or three to reach all parts of the work. The entire line is predicated on the fact that no round ball can burnish into an angle however obtuse such angle may be, and their interlocking tendency provides the necessary resistance within the mass to effect a sufficient alteration in the degree of plasticity of the surface to close porous areas providing for the utmost resistance to both corrosion and wear.

A copy will be sent to all those who will write to Beaverbright Division, The Abbott Ball Company, Hartford, Conn.

Pentrate. A concentrated processing bath which applies, through chemical action, a penetrating, durable, satin black finish to products made of steel is described in the "Pentrate" bulletin now being issued by Heatbath Corporation, Springfield, Mass. This finish is said to act as an aid to lubrication and reduce friction, wear, and scuffing on moving surfaces.

The types of industries now using Pentrate are listed in the bulletin and a description of the manner in which savings were effected by the use of the Pentrate process are contained in the bulletin.

This beautifully illustrated bulletin will be sent to those firms who will send their request to Heatbath Corporation, Springfield, Mass., on their firm letterhead.

Solution-Lifting Oakite Steam Gun Model 384. Finishing department executives interested in the rapid removal of dirt, grease, grime, and similar deposits from equipment by means of steam cleaning will find useful information in this folder now being issued by Oakite Products, Inc., 20 Thames St., New York, N. Y. Steam cleaning with the Oakite Solution-Lifting Gun is obtained by means of the projection of a high velocity spray of steam together with the correct mixture of a recommended Oakite solution. By means of the gun, a correct, balanced combination of heat, detergent action, and mechanical force are brought to the surface to be cleaned.

The Oakite Steam Gun Model 384 described in this folder may be operated with air, if steam is not available. Copy of this folder will be sent free upon request.

"TAG Pyrometer and Resistance Thermometer Catalog No. 1101 E." This is the title of a 36-page catalog describing TAG "Celectray" Electric Thermometers and Pyrometers now being issued by C. J. Tagliabue Mfg. Co., Park and Nostrand Aves., Brooklyn, N. Y. Described in the pages of this catalog are the many ways in which TAG Celectray Pyrometers are used in the process industries.

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Munning and Munning Bulletin No. 12. Products that meet the requirements of the plating and polishing industry are illustrated and described in this 62-page catalog now being issued by Munning & Munning, Inc., 202 Emmett St., Newark, N. J. In substance, it largely comprises a compilation of pamphlets and other loose-leaf literature that has been distributed to the trade from time to time. To keep pace with the progress of new ideas, constant revision of the catalog will be made.

Each of the bulletins or additions to this original catalog will deal with a different group of products, so that ultimately they will encompass the complete line of equipment and supplies for the electroplating, polishing, and buffing industries now being manufactured by Munning & Munning, Inc.

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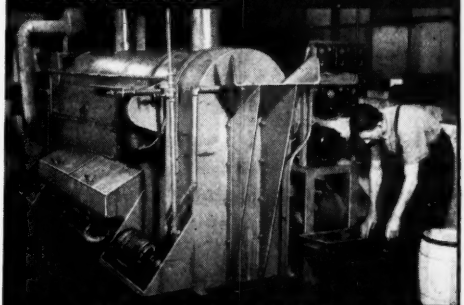

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BARREL FINISHING OF METAL PRODUCTS

Factors in Wetting, Penetration, Emulsification and Deflocculation as they appear in barrel finishing procedure.

By H. LEROY BEAVER

FOLLOWING the publication of each of the papers in this series, we generally receive correspondence from all parts of the country commenting on this or that phase of the subject. From this we can gather a fairly accurate cross section of the trend of thought of those who are interested in the various phases of the finishing of metal products as they are discussed in the series.

We have noted especially that whenever we write of matters relative to cleaning of parts in any stage of the operating cycle, that this phase always provokes more lively interest than do those which discuss the simple mechanics of the operation of obtaining a highly lustrous surface finish or what we commonly know as a "barrel burnishing" operation. From most of the Branches of The American Electroplaters Society where we are scheduled for personal appearances during the current speaking season, the request almost invariably is made that we do not forget to discuss barrel finishing as it relates to operations on the basis materials prior to deposition of the plate. In other words, Barrel Cleaning.

In the discussion in the October Issue of PRODUCTS FINISHING, we attempted to draw a comparison with one of the most important cleaning operations, the laundering of soiled clothing, and what we could learn from a study of this procedure that might be applicable to the cleaning of metal parts, either before or after the plating cycle. Now in examining this subject, we find that the underlying principles are almost identical with those applying to the cleaning of metal parts; that is, the principal factors are wetting, penetration, diffusion, detergence, emulsification and deflocculation.

In the matter of plating procedure we believe it is pretty generally agreed that we have progressed far in our knowledge and understanding of the various plating solutions and their operation to obtain the maximum of satisfactory results, but on the subject of cleaning of the parts prior to plating we have lagged, or in other words, the research into cleaning has not been as intensive as

has that on plating solutions and deposition procedure.

Perhaps we might say that much of this what we might call new interest in detergency has arisen from the flood of new synthetic detergents that have appeared on the market literally by the hundreds. Some of these products have been patented as wetting agents, emulsifying agents or detergents. While we have experimented with a large number of them, we do not find them all equally effective for the purposes for which they have been recommended and in some cases, they do not function at all when applied to barrel finishing procedure.

The term "detergent" has been used so widely and so frequently that the question arises "Just what is a detergent?" For the answer to this question and for what we consider a fine though short definition we take the liberty of quoting Dr. L. P. Hall* as follows: "A cleansing agent used to free a surface or a material from dirt, soil, filth, or any other unwanted substance." Thus, the term would include all such mediums as the soluble soaps of fatty acids as well as the new synthetic soaps and all the array of alkaline cleaners, insofar as they assist in the removal of unwanted grease, dirt or soil, both from the surface as well as the pores or interstices of metal products. In any study of the subject, we must include the factors of the nature of the material to be cleaned, the character of the soil or unwanted substance to be removed, the action of the detergent solution on the surface of the material to be cleaned, as well as the effect of

*Dr. L. P. Hall, Research Chemist of Roehm & Haas Co., Philadelphia, Pa.

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the detergent material itself when used under either acid or alkaline conditions.

In the cleaning of metal parts prior to plating we generally only need to consider two types of what we term "soil." First, oil or grease and second, any form of solid or residual soil. The general idea is that after the original wetting of the material itself as well as the grease or other residual soil either on the surface or in the pores has occurred, then emulsification of the grease or dirt takes place and this is followed by the process known as deflocculation. Here we are indebted again to Dr. Hall for another definition creating a better understanding of detergency, as follows:

> "The effect of a detergent on insoluble soil is to change the nature of the surface of the soil from one which is indifferent to water or from one which repels water, to one which is attracted to water."

The principal factors contributing to detergency as applied to the cleaning of metal products are then, wetting, penetration, emulsification and deflocculation. Wetting plays an important part in the cycle as does penetration because much of the residual soil is held in the pores of the metal itself or in interstices arising from mechanical forming or in some cases from rough grain structure. We must, by the use of an appropriate wetting agent, reduce the surface tension of the cleaning liquid in order to enable us to penetrate the pores, surround the particles of dirt or soil and then by emulsifying this material loosen it and by the following process of deflocculation hold it in suspension until we can rinse it away thus leaving a clean surface as well as porous structure. Unless unwanted material that has become trapped in pores of the metal surface is removed, we are pretty sure to run into serious difficulty in any subsequent procedure to be applied in the finishing cycle whether it be plating, enameling or lacquering.

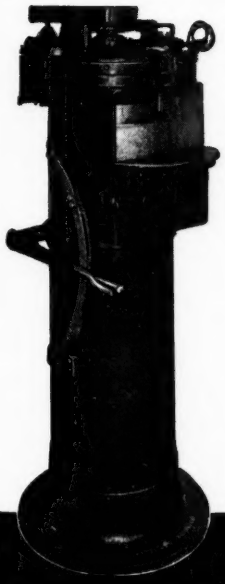
Now the main difference in cleaning in still tank and cleaning by the barrel method lies in two factors. First, in the barrel method we clean while the parts are under agitation, and secondly, we can bring about a far greater degree of deflocculation in the barrel method because we need not seriously consider the amount of suds produced which holds in suspension the unwanted residual soil or dirt. The suds are confined within the barrel whereas in an open tank any comparable agitation creates such a mountain of suds that would overflow the average cleaning tank and render working conditions impossible. By using a satisfactory soap with proper alkaline builders, we can maintain a situation where residual soil is held in suspension until the load is dumped from the barrel and the suds, when rinsed away, will leave a surface far cleaner than can be obtained from any still tank method of cleaning parts.

In tank cleaning, whether still or electrochemically, we have a minimum of agitation, whereas in barrel cleaning we approach nearer to a maximum. This gives us another interesting comparison because when any metal parts are operated in a fluid while under agitation, a resistance of the parts while in motion through the detergent solution is generated which is known as fluid friction. It is due to the viscosity of the fluid, but generally speaking the laws of fluid friction are very different from that of simple viscous resistance. In barrel cleaning, the opera-

tion of the mass of parts through the solution sets up rotating eddies due to the resistance of the admixture of metal parts, with the steel materials used as a cushioning medium between the parts themselves rather than as a medium for producing a bright or lustrous surface finish. Consequently, in a barrel cleaning operation we have all of the factors of a still tank operation, but of course, without the electric current. In place of current we do cleaning under agitation with its accompanying application of fluid friction to dislodge the unwanted soil after wetting, penetration and diffusion have taken place. As a result, all of the soil is held in suspension in a lather created in an operation from which it can be readily rinsed away.

There are so many factors involved in cleaning cycles that it would be impossible to touch upon all of them in the course of one of these brief discussions. One of the more important factors, however, is that of saponification. This condition occurs when soluble greases or oils are combined with the admixture of alkalies used in the average cleaning compound. The alkalies combine with soluble fats and oils in such a way that they form soaps right in the barrel during the cleaning process. In many cases, the soaps so formed prove most efficient because saponified grease or oil may help in no small sense to emulsify other grease present and enable it to be washed away in the rinsing process. We know of no way to measure surface tension of solids or interfacial tensions between solids and detergent solutions, hence no discussion of this phase.

In order to remove unwanted soil such as grease, oil or other residual dirt from pores in the surface of the metal, the detergent solution must



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penetrate the pores on the surface to be cleaned in order to reach the soil and surround it. The general rule applicable in following such action may be derived from Poiseuille's law of viscous flow, which is too well known to the readers of this series to require amplification here.

Emulsification, of course, is of paramount importance in the general detergent scheme. Most likely it is very true that some compounds remove grease or oil entirely by emulsification, but it is more likely that the more powerful detergents depend for their effect on the removal of grease and oil by preferential wetting with a subsequent emulsification of the grease or oil.

In the experiments thus far made, we do not gain much ground by the use of any of the more popular alkaline cleaners used in still tank cleaning, unless we combine them with a soap in proper proportions. We have previously discussed the necessity for the addition of alkaline builders to any soap used in any application of cleaning in barrel finishing practice.

In experiments in the use of soaps without the use of alkaline builders and wetting agents, we have never been able to obtain a condition of cleanliness of surface that we would consider as acceptable for plating deposition. Last month we commented on the mistaken recommendation of two ounces of chip or flake soap to a barrel load of work. In some of our experimental work using simply soaps and water, we have stepped up the soap content until we reached nineteen ounces of soap to a gallon of water. This was obtained by adding this quantity of soap to the water and then slowly heating until the soap was all dissolved. The solution was then permitted to stand for twenty-four hours, after which the clear soap on top was siphoned off from the inert material. The product of hydrolization that had settled on the bottom of the container was discarded and the clear soap solution used. Even with this great concentration (six pounds of soap chips to five gallons of water) we were unable to obtain, even with the most careful rinsing, a surface that we would consider satisfactory for the deposition of a plate. Now in contrast to this we took the same kind of soap (in this case a sodium oleate) and added alkaline builders in the form of 58 per cent light soda ash, tetra sodium pyrophosphate and one of the new synthetic wetting agents known in the trade at Triton W-30. We found that by using two ounces of this alkaline-built-up-soap per gallon of water, coupled with the addition of the tetra sodium pyrophosphate to prevent the formation of insoluble lime soap curds, and the Triton W-30 to act as a wetting agent and to reduce the surface tension, parts could be operated in this solution and be rinsed clean and clear of any water breaks at a water temperature as low as 90 degs. F. From this it would be apparent that none of the chip or flake soaps commonly used in barrel finishing practice are effective, to the extent that they must be, in order to provide proper plating surface, in any concentration whatsoever. The conclusion is drawn that auxiliaries must be added to build up their properties from the point of view of wetting ability, detergency, saponification, diffusion and dispersion as well as deflocculation.

We have previously suggested that our electro chemists and especially those almost solely engaged in research connected with the finishing of metal products might gain much by excursions into other fields of en-

deavor and more particularly those wherein problems involving wetting, saponification, diffusion, dispersion, detergency and deflocculation occur in the same degree as they do in metal finishing. In the field of textiles, for example, there is a process for determining the efficiency of a solution for wetting properties known as The Draves Sinking Time Test. This is the officially adopted test of the American Association of Textile Colorists and Chemists, and there may well be a relation between the factors governing this test and factors in connection with the cleaning of metal products. Then, too, preferential wetting is a most important factor in the preparation of practically all spray types of insecticides where the maximum of spreading coefficient is aimed for in the same sense that we aim for such wetting in the preparation of metal products.

If it is true that cleaning as a factor in electro deposition of metals has not kept pace with development and control of the plating solutions themselves, then it is equally true that the American barrel manufacturers have been equally as lax in their development of a wider variety of types of barrels to be used in the various metal finishing cycles. True, for purposes of experiment most any of the current types of barrels can be used, but it could hardly be said that they would be as efficient and practical as they might be in carrying out of a cleaning process. The average single pocket laundry wash wheel might prove to be an interesting inspiration to some of our barrel manufacturers and draw a lesson from the principles involved in the instrumentality and its possibilities for adaptation to the cleaning of metal products.

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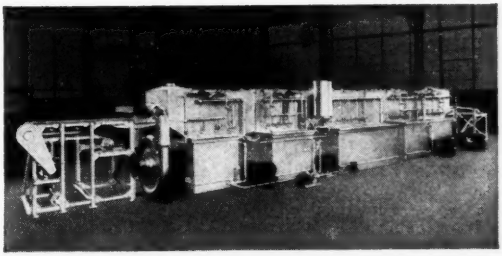

A typical Detrex spray installation consisting of alkali washer, rinses, chromic acid, Bonderite, and air blow-off.

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PAINT MIXTURE CONTROL BY THE VISCOSITY METHOD

A simple device for checking the viscosity of mixed batches of finishing material is described in this article.

By E. A. ZAHN
Schenectady Works Laboratory, General Electric Company

IT IS generally agreed that paint mixture control by viscosity is a safe and practical method. However, there are many metal finishers who still use hydrometers and measuring cups.

Controlling production batches of mixed paint with a measuring cup would be satisfactory if every can of paint from the paint manufacturer had a written guarantee that it was identical with the preceding one, and the weather man could give a guarantee that the temperature would never change. In addition, it would be necessary to have some assurance from the spray gun operator that he was as accurate in his movements as a mechanical device.

Most paint materials are supplied according to a set standard of manufacture which carries a certain minimum and maximum of the ingredients. From the manufacturer's point of view, little variations from batch to batch are not important enough to necessitate reworking several hundred gallons of material each time, and it is reasonable for the manufacturer to expect the consumer to use some little judgment in controlling the mixture when he adds a solvent.

Years ago, when every finisher was able to convince his employer that he had a certain technique which enabled him to tell how good his mixture was by watching it drip from a spatula, no one had any cause to worry about mixture control, but since high speed production jobs require a great number of workmen as finishers, it has become necessary to exercise more accurate control methods. Probably the first step in this direction was the use of measuring devices whereby a certain volume of thinning material was added to another certain volume of unthinned paint.

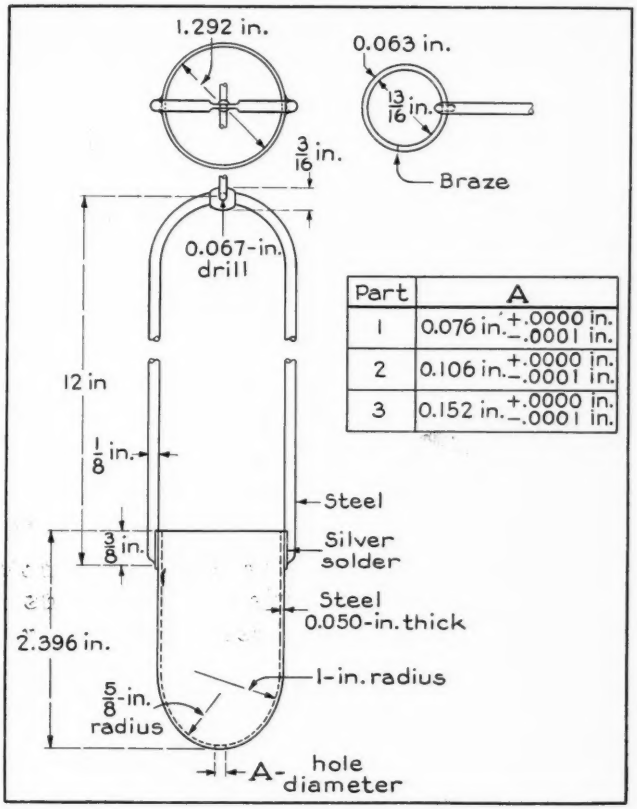
The normal variations in the unthinned paint was not the only difficulty experienced with these methods. For example, the length of time that the paint was stored before use would affect its body and also the prevailing temperatures during application would greatly affect its viscosity.

The next real change in mixture control was the adoption of the hydrometer. This was a decidedly better method than volume measuring. The hydrometer enabled the finisher to take a reading of his mixture at any time after the original mixing. The number of regular thinners in use at that time was limited to a

comparatively small number and, in most cases, there was a wide range between the specific gravity of the solvent and that of the unmixed paint. The temperature variations were hardly noticeable on hydrometer readings, but they most certainly were noticeable during the application of the mixture. There have been many instances where production lines have been shut down because the paint misbehaved, and always after a long study of the problem, it was found that the existing temperatures were either too high or too low for proper application. In these instances, it was possible to find new gravity readings which would make application possible again, but it was too difficult to keep up with the temperature changes.

In going back over the problem, we have asked ourselves just exactly what we do want to know about a material when we mix it for application. We want to know what ability the mixture has to atomize properly at the spray gun and then, what ability it has to flow out to a smooth film after it has been applied to the surface. In other words, we want to know the flowing ability of the mixture and how to control it.

Viscosity is not a new control method for paint mixtures inasmuch as it has been used successfully for a number of years by many metal finishers. However, this method was one which involved fairly expensive equipment as well as trained operators. It was satisfactory for use where the production was large enough to warrant a separate mixing room, where the operator in



Part	A
1	0.076 in. +.0000 in. −.0001 in.
2	0.106 in. +.0000 in. −.0001 in.
3	0.152 in. +.0000 in. −.0001 in.

Fig. 1 — A diagrammatic dimensioned sketch of a device for checking the viscosity of batches of finishing material. The table lists information regarding the three sizes of the device that are available.

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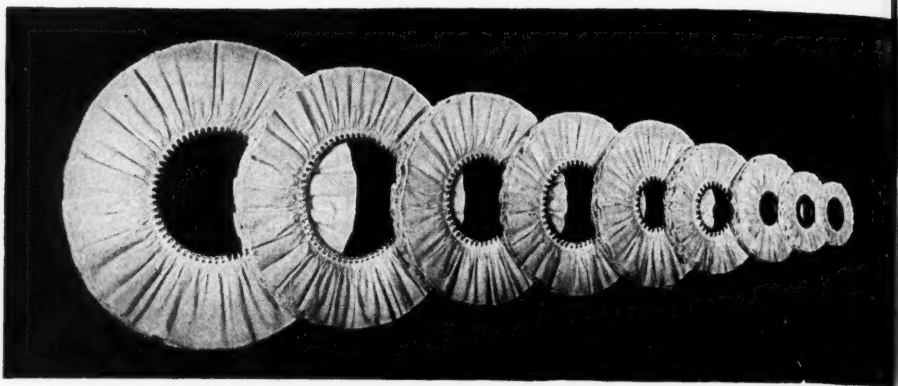

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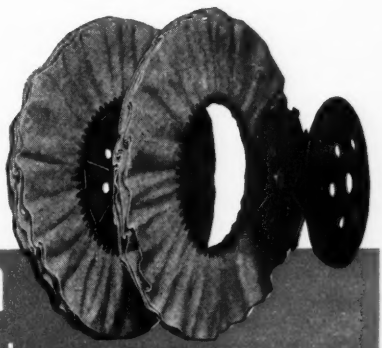


F CORPORATION

LONG ISLAND CITY, N.Y.

charge could be trained to use a viscosimeter. At that time, there were very few air-conditioned spray rooms where the temperature was accurately controlled, which meant that even more accurate viscosity control was necessary to embody the temperature changes.

In most instances, at the proper spraying viscosity and at a certain reasonable working temperature, it is not difficult to control the mixture with almost any type of instrument. However, it would be necessary to heat the sample to be tested to the proper temperature before a reading could be taken. This meant that a great deal of time was involved by each separate reading taken, and if the results indicated that further adjustment of the mixture was necessary, the viscosity control idea would become somewhat of a nuisance. Some users of paint materials have discarded viscosity instruments, and have gone back to hydrometers.

Another common problem with viscosimeters was that a great variety of different makes were available of which no two would give the same readings. These readings were of no value to any one except the owner of the equipment, as they could not be used for reference or comparison unless each had the same make of instrument. Some of these were sold at fairly reasonable prices, and involved a number of different parts, while others were very expensive and quite elaborate in construction. Naturally, the less expensive types became the most popular ones for use with paint materials. Wherever the more expensive ones were used, it was generally an all-purpose instrument, and was used for general viscosity work in the laboratory. One point, however, was not given enough consideration in these viscosimeters, and that was the problem of viscosity control in the factory where only a small quantity of material was kept mixed at one time. The common viscosity measuring methods were impractical for small amounts of finishing materials.

Viscosity control can be of great advantage where a painting material has been standardized, purchased from one manufacturer, and used in a number of different plants. The chief reason for standardization is to enable each plant to produce the same appearance on all their finished work. In this case, it is very important to have each plant use the same method, and the same kind of instrument for continuous control of the mixed paint materials. A chart showing viscosity temperature variations can be prepared by the paint supplier and distributed to the various plants as a control standard. In this way, it would be very easy for each plant to obtain the same results regardless of the existing temperature in his plant. To prepare a viscosity temperature chart originally involved a great deal of time on the part of the paint manufacturer, and often times required all of one expert's time for a whole day.

A simplified instrument has been developed for controlling viscosity by the General Electric Company. Figure 1 shows a diagrammatic sketch of this new viscosimeter.

Viscosity readings can now be made in as short a time as twenty seconds. On some work, viscosity readings are taken every one-half hour in order to avoid any possible trouble which might occur along the line of automatic application.

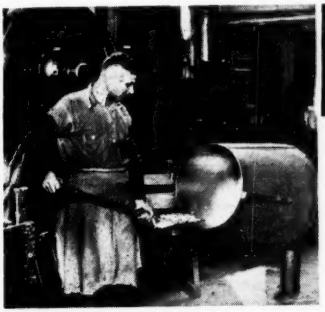
This cup is designed for use in such a way that the possibility of error is reduced to a minimum. For example, with the earlier types it was neces-

sary to heat or to cool the instrument to a certain temperature before a reading could be taken. The new type cup is designed so that it remains partly immersed in the paint mixture, thus the temperature of the cup is exactly the same as the temperature of the mixture at all times.

As shown in the illustration Fig. 1, a small bullet shaped cup having a capacity of approximately 44 cubic centimeters is suspended on a long looped handle. The cup has an orifice at the bottom through which the material flows when the cup is lifted from the material. The time required for complete drainage, beginning when the cup leaves the liquid and ending when the stream breaks at the base, is considered to be the viscosity in seconds. The readings taken with this cup include complete drainage which begins from maximum head pressure of the full cup to zero pressure at the end reading. Other types measure from maximum head pressure of a full cup to an unknown pressure because complete drainage was not previously used.

Due to its unique construction which includes only a single unit, it is possible to convert the readings taken with this instrument to centepois readings by using only a single conversion factor. We believe that this is due to the fact that a thin plate orifice is used instead of a tubular one, and also because outer surface drainage is used.

The type of instrument illustrated is available in four different orifice sizes which will accommodate a wide range of materials. When very accurate measurements are to be made, the cup having the smallest usable orifice is used. However, on some applications it is possible to use a cup having a very large orifice which is



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MAGNUS CLEANERS

capable of producing accurate reading in from 10 to 12 seconds.

The early types of instruments made use of several different parts and the material being measured was generally allowed to pass through the orifice into a receptacle of a given capacity. When measuring colored materials, it was difficult to determine the exact end point because the formation of bubbles in thin liquids would prevent the operator from seeing the exact point at which the receptacle was filled to a given mark. Furthermore, in the earlier types it was necessary to clean after each reading. With the new instrument, it is not necessary, nor is it advisable to clean after each reading. The cleaning very often results in a surface condition within the cup which is some times more easily wetted than at other times, and causes a variation in drainage pressure. The end reading is very abrupt and can be timed to within one-fifth of one second by any inexperienced operator. The cup remains in the liquid at all times except during reading time which causes a uniform wetting with the material being measured.

There are many applications where viscosity measurements could not be used in the past, but through the development of the instrument just described, there is no longer any reason why the viscosity of small paint quantities cannot be controlled. It has found its best use in the control of mixtures in automatic dipping tanks and other automatic application devices.

Fostoria Fluorescent Canopies. The new Fostoria Fluorescent Canopies recently placed on the market by The Fostoria Pressed Steel Corporation, Fostoria, Ohio, and considered by this company to be a new tool for industry are described in this catalog.

The catalog describes 25 different models, ranging from a single 15-watt model to a two-tube 80-watt model. Fostoria Fluorescent Canopies are 20 in., 26 in., 38 in. and 50 in. long and are equipped for overhead, table or bench mounting.

Copies of this catalog giving complete descriptions and specifications will be sent free upon request.

Bristol Bulletin 525. A complete line of humidity recorders and controllers for air conditioning, heating, and drying processes is manufactured by The Bristol Company, Waterbury, Conn. A new publication, designated as Bulletin 525, describes these instruments.

In this publication, information regarding Bristol's Wet and Dry-Bulb Psychrometers is given, with illustrations of the various types of fixtures available to meet the requirements of the application. Also, instruments for recording humidity and temperature directly on the same chart, using a hygroscopic measuring element, are described and sample chart records are shown.

A copy of Bulletin 525 may be obtained upon request.

Electrical Interlock for Alternating Current. The use and care of the Type L-33 electrical interlock for alternating current, along with complete renewal parts data, are included in a new instruction bulletin being distributed by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

The Type L-33 interlock is designed for mounting on and controlling a-c, Type F contactors of 200 amperes capacity or less. It may be used as a "make" or a "break" interlock. The interlock is rated at 5 amperes continuously on control circuits up to 600 volts, a-c.

Copies of instruction bulletin 2806 may be obtained from headquarters of Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

Interesting Articles for Metal-Finishing Departments. Devoted to the cleaning and related problems of industry, "Oakite News Service," house magazine of Oakite Products, Inc., 20 Thames St., New York, N. Y., features

in a recent issue two illustrated articles which will be of particular interest to metal-finishing department executives.

The first article is a resume of a unique, yet simple installation made in one shop for mixing acid bright dips without encountering the dangers usually associated with work of this kind. The other article, entitled "How Tin Coatings Are Applied," describes and illustrates electro-tinning and hot-tinning operations.

Free copies of "Oakite News Service" can be obtained by writing to Oakite Products, Inc., 20 Thames St., New York, N. Y. Future issues will also be sent without obligation to those plants wishing to receive this publication regularly.

Clark Bulletin L-212. This bulletin describes the Clark Steel Welded Truck which is now being marketed by All Steel Welded Truck Corporation, Rockford, Ill. The bulletin describes the new construction which is said to allow the use of a light gauge deck, but still prevents deck sag under any normal load and weighs less than the conventional heavy-duty truck. The fabrication is by means of electric welding and practically eliminates any possibility of its breakage.

Other construction features of the Clark Steel Welded Truck are described. A copy of Bulletin L-212 will be sent free upon request.

Catalog of Safety Problems. The American Optical Company, Southbridge, Mass., announces the publication of a new industrial safety equipment catalog. The catalog describes in detail a line of eye, head, and lung protective equipment, and also a line of safety clothing.

Among the items described are goggles for protection against impact, glare, splashes of liquids, particles of dust, and face shields, respirators, hoods, and so on. Valuable information and advice is incorporated in the description of the safety equipment.

Copy free upon request.

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2 SAFETY NEEDS for your Finishing Shop!

These safety precautions are essential to protect workers in dusty operations ...to safeguard eyes against hazards of dusts, fumes and splashes. Both items are widely used thruout industry. Write for details and prices.

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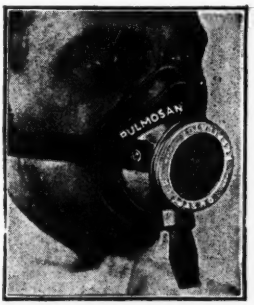
SAFETY EQUIPMENT CORP.
Dept. PF, 176 Johnson St., Brooklyn, N. Y.



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Extremely comfortable, efficient protection against non-toxic dusts. Weighs only 3 ounces. Permits wearing of goggles. Built for service, yet very inexpensive.

G-520 ALL-RUBBER GOGGLES

Especially valuable in finishing shops. Provides airtight seal against dusts, fumes and splashes. All rubber — unharmed by chemicals. Clear lenses, 2⅛" diameter. Special lenses on request.

A view of the new Ferro Color plant. The corrugated steel roof, stack, window-sash and gutter-hangers are finished in porcelain enamel.

UNUSUAL APPLICATION EXTENDS FIELD OF PORCELAIN ENAMELING

FERRO Enamel Corporation, Cleveland, Ohio, has just completed a new factory for the production of colors to be used in porcelain enameled ware, clay tile, pottery, china, and glass. This paint is unique in that it is said to make the first use of porcelain enamel as an exterior as well as an interior finish in the factory building field.

The roof, stack, gables, trim, gutters, window-sash and doors of this building are finished in porcelain enamel. On the inside of the building, the partitions separating the offices, laboratory, and plant are also finished with porcelain enamel. The purpose in making this installation is to demonstrate the possibilities for porcelain enamel in the factory building field.

Modern science is said to provide porcelain enamel with an almost complete resistance to the ravages of weather, acid, and corrosive fumes. Porcelain enamel is a form of glass which is fused to metal at high temperatures. The firmly bonded glass protects the metal from rust and lasts almost indefinitely since it is inorganic and not subject to decay. The outstanding attributes of this unique application of porcelain enamel in the building field are said to be long life, low maintenance cost, protection from fire hazards, and cleanliness.

The roof covering the Ferro Color plant is believed to be the first self-supporting porcelain enameled steel roof ever erected. For some time, executives have felt that there has existed a definite need for an industrial roofing system with reference to service life.

After considerable investigation, the Kor-Lok system was developed by the Kor-Lok Company, Cleveland, O., to enable the fabrication of a roof such as is used on the Ferro Enamel plant. This system makes use of a patented inter-locking formation of the type which is shown in Figure 1.

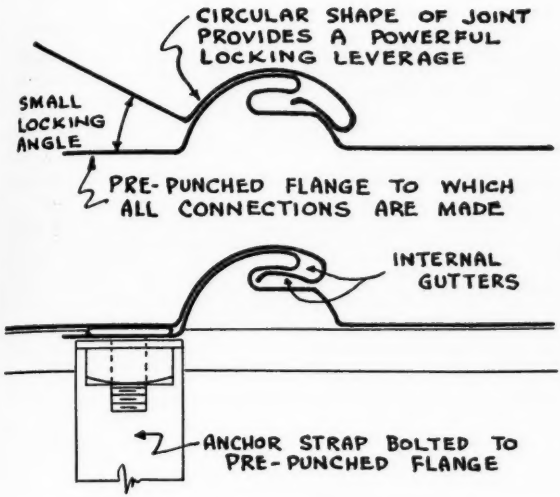
CIRCULAR SHAPE OF JOINT PROVIDES A POWERFUL LOCKING LEVERAGE
SMALL LOCKING ANGLE
PRE-PUNCHED FLANGE TO WHICH ALL CONNECTIONS ARE MADE
INTERNAL GUTTERS
ANCHOR STRAP BOLTED TO PRE-PUNCHED FLANGE

Fig. 1—Illustration showing the construction of the locking joint. Above is the starting position of the locking joint and below is the finished assembly.

All exposed bolt holes for fastening the sheet to the roof deck are eliminated. All bolt heads are concealed and protected by an overlapping sheet. The type of sheet used in conjunction with the Kor-Lok system permitted the erection of the main portion of the roof with standard size sheets. No punching of holes was required.

For the Ferro Color building, the sheets that were not standard size were cut to size before porcelain enameling. Since only a thin coating of porcelain enamel was used, no serious chipping of enamel along cut edges resulted when this became necessary on the job.

Of interest to the porcelain enamelers is the procedure employed in the finishing of the Kor-Lok roofing sheets. The sheets were dipped in sheet iron ground coat enamel, dried and oversprayed on the "weather" side with a special weather-resisting enamel. The sheets were then fired in order to obtain a tight, practical coating of porcelain enamel with a very high resistance to damage by

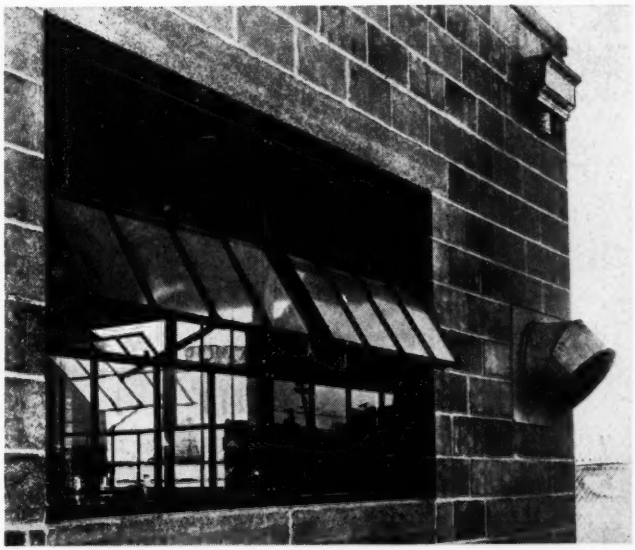

Fig. 2—A view of a porcelain enameled steel window-sash installed in the Ferro plant.

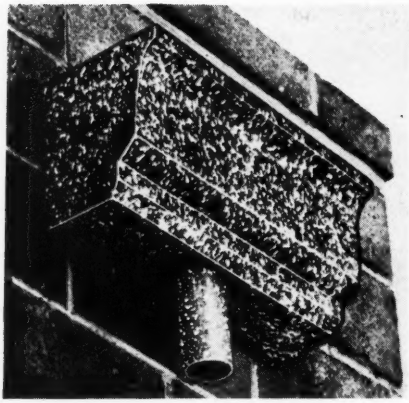

Fig. 3—Porcelain enameled steel hanger into which a patented porcelain enameled steel solderless gutter and also downspouting will be inserted.

impact. The overspray of special weather-resisting enamel provides a dense coating over the ground coat on the weather side and helps eliminate the slightly porous structure that might be the result if ground coat only were used.

Where the underside of the roof is not covered by a secondary facing material such as plywood, celotex board or similar material, it is possible and quite desirable to porcelain enamel the underside of the sheets with white porcelain enamel. This increases the cost slightly, since two firing operations are then required, but the advantages gained are said to more than compensate for the difference. With the application of a white underside, approximately 70 to 85 per cent white light reflectance is said to be obtained. In addition, to clean such a roof it is only necessary to wash it down with water and perhaps a small amount of soap. The value of a light reflecting ceiling is of interest to those manufacturers who demand good lighting in their operations.

In the first application of porcelain enameled roofing, more than 7,000 sq. ft. of material was used. The porcelain enameled roofing is said to be particularly adapted to those industries where process-fume conditions are severe.

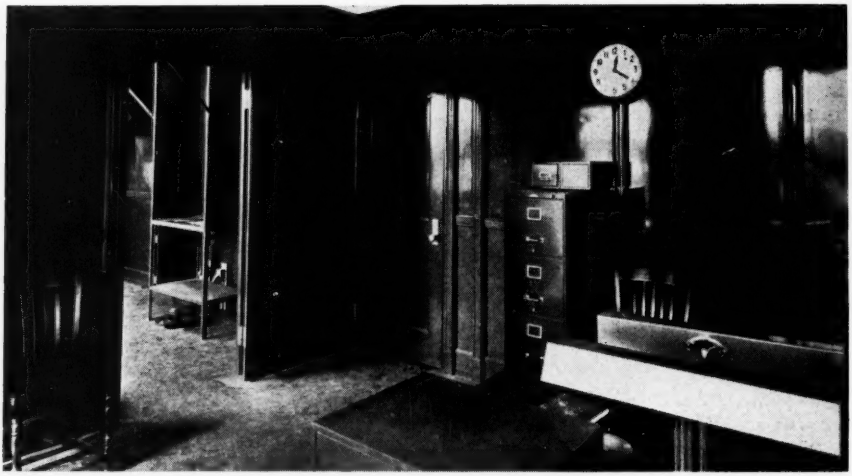

Fig. 4—A view of the offices showing porcelain enameled steel partitions.

The steel partitions inside the new plant are finished in a rich shade of brown porcelain enamel and were made by the E. F. Hauserman Company, Cleveland, Ohio. These partitions are said to demonstrate the practicality of porcelain enameling partition units for offices, stores, and laboratories. The sections are easily cleaned, require no periodic refinishing, and are said to retain their quality of newness indefinitely.

All of the industrial window-wash is porcelain enameled, using a black ground coat with a black overspray to produce a fine textured, tight enamel finish which is resistant to action of the most severe weather. The flanges of the sash that are buried in the wall are also porcelain enameled to provide protection against corrosion from the dampness that often collects there.

Porcelain enamel finishes are desirable in industrial buildings in acid fume areas, or where acid or corrosive fumes are produced to any extent in industry. Porcelain enameled sash is said to be of particular value in walls of acid pickling rooms of steel mills as well as walls of plants of many chemical industries.

The metal stack for the large sintering furnace in the Ferro plant is also porcelain enameled. Around the edge of the porcelain enameled roof, patented porcelain enameled metal solderless gutter will be used.

De Bothezat Ventilating Fans. More than 200 axial flow pressure fans, ranging in size from 8 in. to 10 ft., are included in a new illustrated catalog which is now being issued by the De Bothezat Ventilating Equipment Division, American Machine and Metals, Inc., East Moline, Ill. Copies of the catalog and price lists may be obtained by writing to De Bothezat at East Moline, Illinois.

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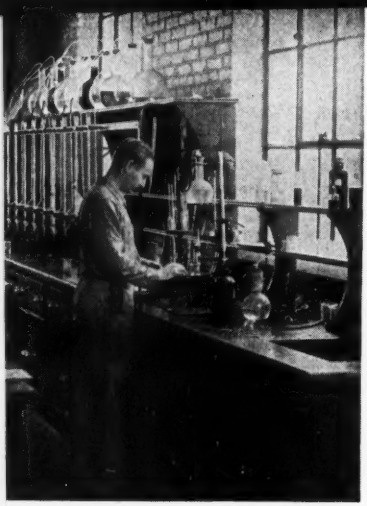
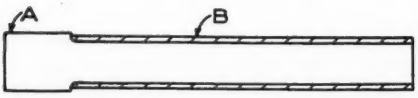


THE Finishing FORUM

Fixture for Making a Damascene Finish on a Polished Metal Surface

By Joe Cowles

THE drawing illustrates a fixture designed for use in making a damascene finish, such as found on watch works and other polished metal surfaces. The fixture consists of a piece of maple or other hard wood turned approximately 3 in. long that fits snugly into a piece of ⅜-in. metal tube designated as **B** with one-half inch of the turned wood extending out. The metal tube **B** is used to prevent crushing of the wood when held in a drill press chuck and also to prevent flaring at the end.



Fixture used in making a damascene finish.

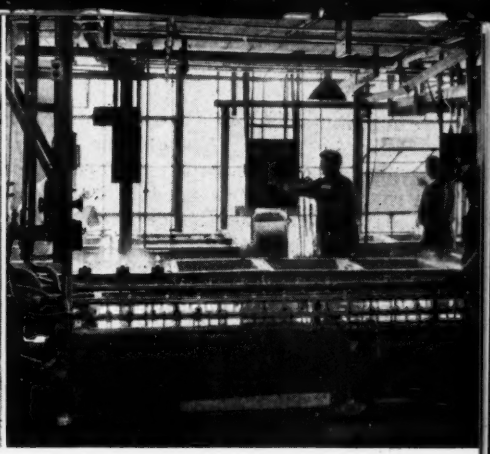
In use, the fixture is chucked in a drill press by the metal tube and a medium grade of emery grinding compound placed on a flat surface and mixed with a little oil to form a paste. With the tool running at a good speed, it is brought down onto the paste several times in order to charge the end **A** with emery. A little oil is then spread on the surface to be finished and the tool brought down hard, raised and moved over about one-half its diameter and brought down again and so on, until a beautiful and blended finish is obtained.

Spot Test for Reducers

By W. G. Sheane

THE evaporation rate of reducers for organic finishing materials can be used in a number of ways in the finishing room. For example, if a container of reducer has lost its markings and the quantity is too large to discard, the evaporation rate is a clue to its identity. Or, if it is desirable to know which of two or more reducers is the fastest for manufacturing reasons, the evaporation rate is the absolute answer.

An inexpensive, fast and practical



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Through the cooperation of outstanding authorities in the fields of metal cleaning, plating, burnishing, lacquering, and so on, PRODUCTS FINISHING is prepared to aid you in the solution of your finishing problem. There is no charge for this service.

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If there is a "kink" or short cut in use in your shop, send in a description of it. . . . Each one published will be paid for.

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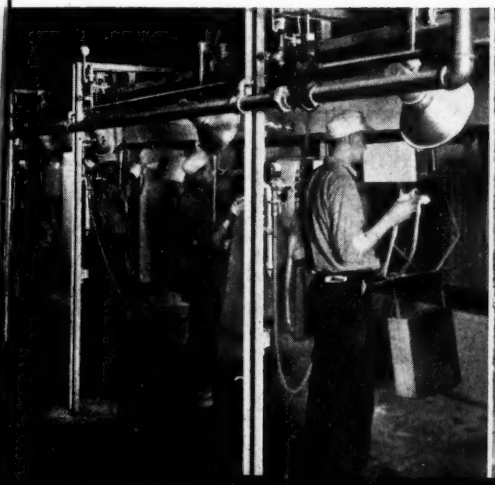

determination of evaporation rate may be made through the use of clean, absorbent paper, preferably the white filter paper used in laboratories for separating solids from liquids. Small quantities of reducer are poured on the paper until it is just saturated. Not so much is used, however, that the paper drips. The wetted paper is then hung in a draftless area and a periodic examination is made of the odor and the speed with which the paper becomes dry. When checking reducers against one another, it must be borne in mind that the papers must be prepared and examined together. Differences in room temperature or a variation in air currents will cause differences in the evaporation of the reducers and the test becomes pointless.

The use of filter paper may also be extended to testing reducers for color content. On standing in metal containers for long periods, some reducers tend to become discolored. This discoloration may not be apparent until after the finishing material, white in particular, with which it has been used, has been cured. By placing a few drops of reducer on the paper and allowing them to evaporate, the presence of dissolved or suspended coloring matter will be readily determined.

Practical Plating Suggestions

By Edward Finnie

Suggestions for Adding Non-Pitting Agent to Plating Solution

WHEN production is pressing the plating foreman and when his nickel solution begins to pit, there is a method whereby he can add peroxide or any other non-pitter without losing too much time. The necessary equipment includes a 8 or 10 in. funnel and about a 4 ft. length of pipe. One end of the pipe should be plugged and several holes drilled in the side of the same end of the pipe within two or three inches of the end. The spout of the funnel should be inserted in the opposite end.

When the tank is emptied of work, the funnel and pipe can be placed in the solution and the non-pitter poured to the very bottom of the tank. The non-pitter will flow out of the drilled holes sideways into the solution and float upward. In this manner, stirring of the solution is unnecessary and a solution which may have been useless for hours can be worked almost immediately.

Air Skimming

Air may be piped along the top of any plating tank and the stream directed in such a manner that it will blow any scum or dirt on top of the solution into one corner where it can be skimmed off very easily. This will eliminate skimming the entire tank and will make the skimming of large tanks a simple matter.

Anode Rod Covers

Strips of canvas cut to 6 in. in width can be used to cover anode rods and anode hooks in plating tanks to prevent dust and dirt from settling on the rods and anode hooks. This will also prevent bad contacts and will save time that would otherwise be required to sand and clean the anode rods.

"Spraco Painting and Industrial Finishing Equipment." This is the title of a 30-page catalog now being issued by Spray Engineering Company, 120 Central St., Somerville, Mass. For more than 20 years the Spray Engineering

Company has specialized in the design and manufacture of spraying equipment. The spray painting and industrial finishing equipment illustrated in this catalog represents the best result of long experience in the finishing field.

Spraco equipment is built to conform to the specifications of the National Board of Fire Underwriters and all equipment items are tested and approved by the Factory Mutual Laboratories in Boston, Massachusetts.

The services of Spraco engineers are available for consultation work in connection with special application problems and are prepared to design and build equipment necessary to meet particular operating conditions.

This catalog is very well illustrated and contains information which will be of interest to all finishing executives. A copy of "Spraco Painting and Industrial Finishing Equipment" will be sent free upon request.

"Nalco Dritherm Infra-Red Ray Lamps for Radiant Drying and Heating" is the title of a folder describing Nalco Carbon Infra-Red Ray Lamps, which are manufactured by North American Electric Lamp Company, 1020 Tyler St., St. Louis, Mo. This folder describes clearly the manner in which the infra-red ray system of drying is used. This type of lamp can be used for drying lacquer, paint, enamel, and so on.

A copy of "Nalco Dritherm Infra-Red Ray Lamps for Radiant Drying and Heating" will be sent free upon request.

"Red Devil Catalog No. 17." This is the title of a handsomely illustrated three-color reference manual which will be issued to executives in the finishing field by Landon P. Smith, Inc., Irvington, New Jersey.

Every item in the Red Devil line of tools, machines and miscellaneous articles is described and illustrated. Catalog No. 17 lists the following items: electric paint conditioners, sanding machines, knives, scrapers, and other miscellaneous tools.

A copy of "Red Devil Catalog No. 17" will be sent free upon request.

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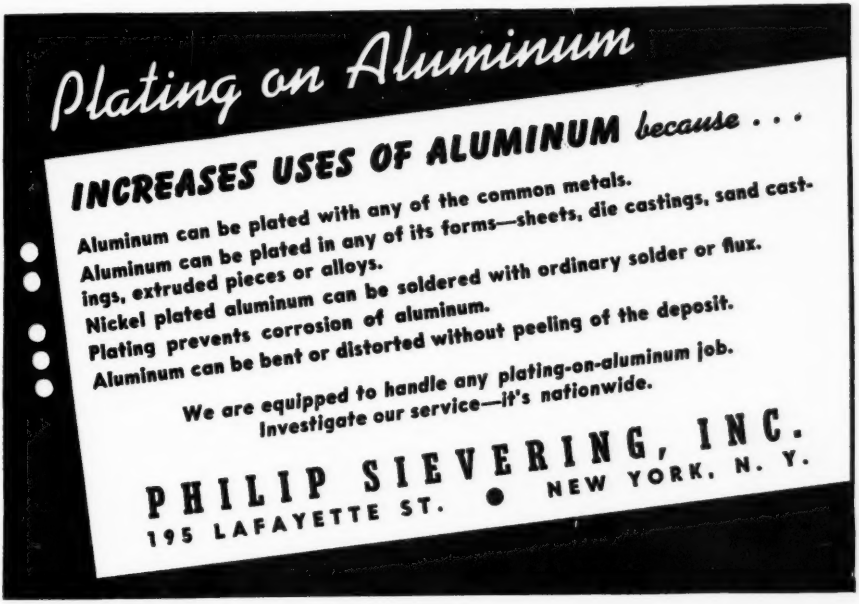
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Aluminum can be plated in any of its forms—sheets, die castings, sand castings, extruded pieces or alloys.
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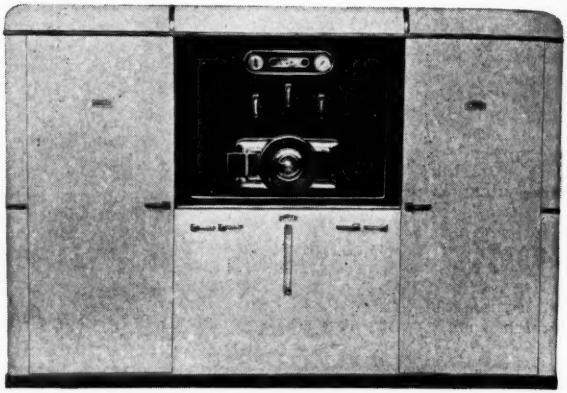
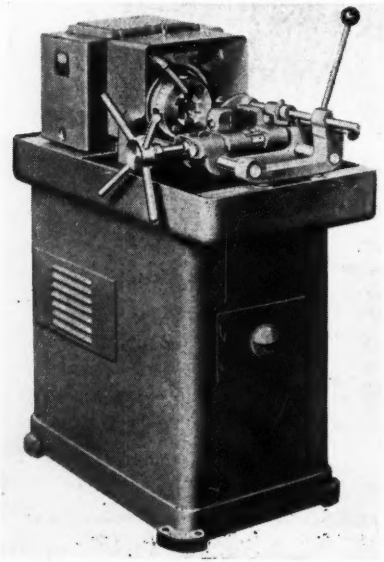
Finishes THAT AID IN APPEARANCE AND UTILITY

(Right) Excellent proportions, smart lines and the harmonious arrangement of the operating controls both for convenience and artistic balance, incorporate a "beauty plus utility" note in this dry cleaning cabinet. Beauty of line is further augmented by the semi-gloss black and white synthetic enamel finish and stainless steel trim.

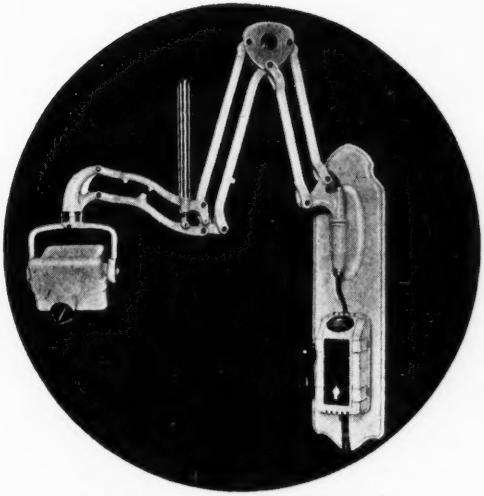


(Photo courtesy Designers for Industry Inc.)



(Photo courtesy Designers for Industry Inc.)

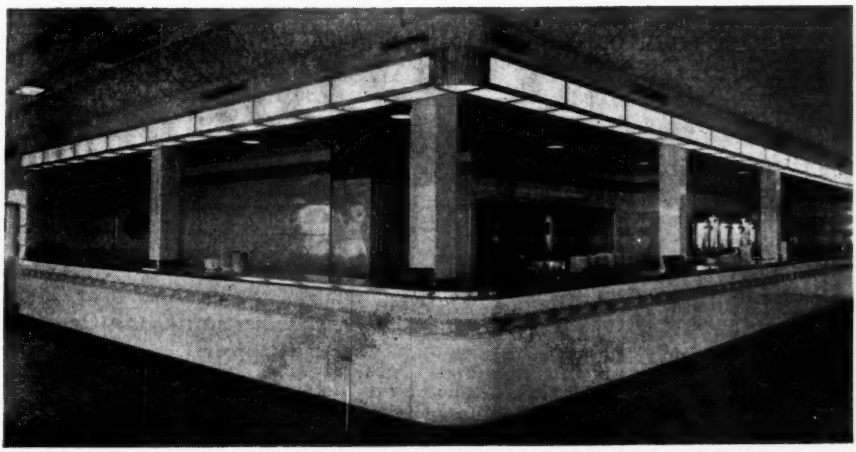
(Left) The increasing recognition of symmetry of form in machine tool design as being a practical sales asset is attested by the streamlined bolt machine shown here. Glazing the surface of the base metal before the application of a prepared machine tool enamel assures a smooth finished surface.



(Photo courtesy Dow Chemical Company)

(Above) Lightness of weight is provided this Dental X-Ray unit which is fabricated from a magnesium alloy. Beautiful appearance is obtained through the proper preparation of the base metal and the application of three coatings of specially prepared baking lacquers.

(Below) "A temptation to eat" might well be the caption for this large and handsome cafeteria installation at one of the popular beach resorts near New York City. The panels for the counter are finished in deep buff. The walls, ceiling above the counter and all columns are light buff. Trimming around the walls is green and blue.



(Photo courtesy Designers for Industry Inc.)

News OF THE INDUSTRY

Strausser Joins Stevens Staff

Mr. P. W. C. Strausser, who for eight and one-half years has been research associate for the American Electro-Platers Society at the National Bureau of Standards under the supervision of Dr. W. Blum, has resigned to accept a position with Frederic B. Stevens, Inc., 510 Third St., Detroit, Mich. Mr. Strausser will take over the sales and servicing of the Stevens plating and equipment line of merchandise in the Detroit area.

17th Exposition of Chemical Industries

The 17th Exposition of Chemical Industries may exceed all of its predecessors in size and scope according to advance indications of exhibitor response. The Exposition will be held at Grand Central Palace, New York City, December 4 to 9, 1939. Three entire floors of the Palace are reserved for the event and two floors and more than half of the third have been reserved for exhibitors.

The Chemical Exposition is this year observing its 25th anniversary of service to the chemical industries. Since it was founded in 1915, there have been 16 previous appearances and the Exposition is now established on a biennial basis. Principal sections of the Exposition are chemicals and chemical products, laboratory equipment and supplies, instruments of precision, materials handling equipment, distilling equipment, containers and packaging machines, industrial chemical equipment and machines.

The 17th Exposition of Chemical Industries will be under the personal direction of Mr. Charles F. Roth, president of the International Exposition Company.

Cowles Detergent Organizes Metal Cleaner Department

Cowles Detergent Company, 10525 Carnegie Ave., Cleveland, Ohio, has announced the organization of a metal cleaner department which will solicit business directly from the metal-working plants about the country. Harold L. Trembicki will become manager of this department.

Mr. Trembicki was born in London, England, and went to school at the University of Warsaw in Poland while his father was an American Consul. He was in foreign sales work with the Crucible Steel Company from 1913 to 1920 and with Oakite Products, Inc., as divisional sales manager from 1920 to 1933. He was president of the Ultrex Chemical Products Co. from 1933 to 1938.

John Storm Appointed New York District Sales Manager for The Carborundum Co.

Charles Knupfer, vice-president and general sales manager of The Carborundum Company, Niagara Falls, N. Y., announces the appointment of Mr. John

Storm as district sales manager at New York, N. Y. Mr. Storm's headquarters will be at the company's branch warehouse and sales offices, 601 West 26th St. He will be in charge of the company's sales activities in the Metropolitan New York area.

John Storm

Mr. Storm succeeds Mr. Frank J. Harrington, who has been transferred to the sales department at the main office of the company at Niagara Falls, N. Y. Previously Mr. Storm had been a member of the sales staff at the Detroit branch warehouse and sales office.

Wayne Mendell To Head Sales of Tolhurst Centrifugal Division

Wayne Mendell has been appointed to supervise the sales activities of the Tolhurst Centrifugal Division and other divisions of American Machine and Metals, Inc., East Moline, Ill., in the Chicago area. Headquarters have been established at 35 E. Wacker Drive.

Mr. Mendell was formerly president of the Fletcher Machinery Corporation and vice-president and general sales manager of U. S. Hoffman Machinery Corporation.

Cowles Detergent Announces Personnel Changes

Co. A. L. Mercer, president, Cowles Detergent Company, and Mr. Harold L. Trembicki, manager of the Metal Cleaning Department, announce the appointment of Mr. Newton P. Armstrong as the Cowles representative in New England, with headquarters in Boston. Mr. Armstrong is a Culver man, and has been associated with the Paint and Warehouse Division of the Pittsburgh Plate Glass Company, the Hetzel Roofing Products Company, the Sapolian Company and Oakite Products over the past several years. Mr. Armstrong's experience in metal cleaning particularly fits him to represent the Cowles Detergent Company which is located at 10525 Carnegie Ave., Cleveland, Ohio.

Col. Mercer and Mr. Trembicki also announce the appointment of Mr. Frederick H. Hitchcock as another Cowles representative, in addition to Mr. E. W. Hutchinson, in Detroit and the State of Michigan, with headquarters in Detroit. Mr. Hitchcock is a graduate of State Teachers College, Mansfield, Pa., and, after spending two years as principal and instructor of Sinsbury, Conn., grade school, he entered the industrial sales field and has been associated with the New York Edison Company, Oakite Products, Inc., Almond W. Barnes Soap

"MAGIC" TACK RAGS
IMPROVE YOUR FINISH 100%

MAGIC TACK RAGS remove specks, lint and sand particles--- bring out that deep, smooth luster, produce a faultless surface for white or colored finish. Why use "home made" tack rags when you can buy MAGIC TACK RAGS at trifling cost! They are tackier, do not dry--- are dust-proof and spontaneous combustion proof. Packed in dozen and gross lots or more. Made only by the

Wm. A. Juergens Co.
4036-40 Lagrange Street,
Toledo, Ohio, U. S. A.
If your dealer does not carry Magic Tack Rags, write us for sample.

Company and Herz Manufacturing Company, Mr. Hitchcock has had a broad experience in the metal cleaning field, and is particularly fitted to sell and service Cowles products in the Detroit industrial area. Mr. E. W. Hutchinson, who has been representing Cowles in the Detroit area for a number of years, continues as heretofore.

Lea Appointed Agent for Unichrome

The Lea Manufacturing Company, 14 Cherry Ave., Waterbury, Conn., has made an arrangement with United Chromium, Incorporated, for the use of "Unichrome" Rack Coating-W to insulate plating racks.

"Unichrome" Rack Coating-W is a rack coating material which has been developed by United Chromium, Incorporated. It is a white insulating material which has properties of resistance to plating and cleaning solutions. "Unichrome" Rack Coating-W combines elasticity and tensile strength with toughness and resistance to abrasion. It is not affected by chromium or other plating solutions.

RUST?

DEOXIDINE prepares metal surfaces perfectly for painting.

ELECTRO, SPRAY and THERMOIL GRANODINES protect against rust and preserve paint.

LITHOFORM keeps paint intact and lustrous on zinc and cadmium surfaces.

Write for bulletins

AMERICAN CHEMICAL PAINT CO.

BOX 303 • AMBLER, PENNA.

The Lea Manufacturing Company has had several years experience in insulating plating racks for manufacturers, and has a special department fully equipped for dipping, drying, and immersion of plating racks. This equipment is the most modern obtainable, using electrical heating units thermostatically controlled. This company is in a position to give prompt and efficient service to manufacturers, especially in New England and New York States.

Joseph B. Kushner Opens Electroplating Consultant Office

Joseph B. Kushner, B.S. Ch.E., widely known electroplating engineer, has opened offices as an electroplating consultant at 20 Eldridge St., New York, N. Y. Mr. Kushner has been connected with the electroplating field over a long period of time, both as a practical plater and research chemist, and is well equipped to handle problems that come up in modern plating practice.

He will feature "personalized plating service." With a unique, portable chemical laboratory of his own design, Mr. Kushner will make rapid, accurate tests and analyses of his client's plating baths on the client's own premises (unless otherwise specified). In this way, because of direct personal contact with his client's particular problems, he will be better able to give "to-the-point," practical advice in those matters on which he is consulted, as well as keep a close check on his client's plating solutions.

Mr. Kushner is a graduate of the Cooper Union Institute of Technology, 1933, and is known for his papers on plating subjects in several finishing publications.

A. E. S. Executive Members Formulate Plans for 1940 Convention at Dayton

The executive officers of the Supreme Society of the American Electro-Platers' Society met recently with committee chairmen and members of the Dayton chapter of the A.E.S. to go over plans for the 28th Annual Convention of the Society which is to be held in Dayton, Ohio, June 10 through 13, 1940. Among the members of the Supreme Society present were: Ray Goodsell, president; Frederick Fulforth, vice-president; and

Among those present at the recent Dayton A.E.S. meeting to plan 1940 Convention were: (Standing) Frederick Fulforth, Corliss W. Powell, Charles C. Conley, Ray Goodsell; (Seated) Mrs. Charles Conley, William J. R. Kennedy, Mrs. E. W. Cochran.

•

William J. R. Kennedy, secretary.

The members of the Dayton branch who will assist the members of the Supreme Society at the 1940 Convention include: Wm. J. Wise, publicity; H. C. Luechauer, educational; G. Lewis Smith, exhibits; Corliss W. Powell, program; E. W. Cochran, banquet and entertainment; Leon L. Haas, registration; Edison C. Sickman, recreation; Fred. Berner, plant visitation; Robert B. Skinner, hotel reservations; Clarence Folz, transportation; and Walter Fraine, advisory.

The general chairman, Charles C. Conley, appointed Mrs. E. W. Cochran and Mrs. Conley to act as co-chairmen of the ladies' program.

Charles Wagner Announces Entrance into Industrial Oven Field

According to a recent announcement, Charles Wagner Litho Machinery Co., 51-55 Park Ave., Hoboken, N. J., has announced its entrance into the industrial oven field. According to the announcement, this company has been manufacturing litho and coating ovens for the past 25 years and has developed special points for oven economy that are said to be based on sound engineering. This company will continue to serve its customers with decorative metal ovens, and in addition, will make a complete line of industrial ovens, including: drying ovens, "A" type conveyor ovens, Dulux ovens, and so on.

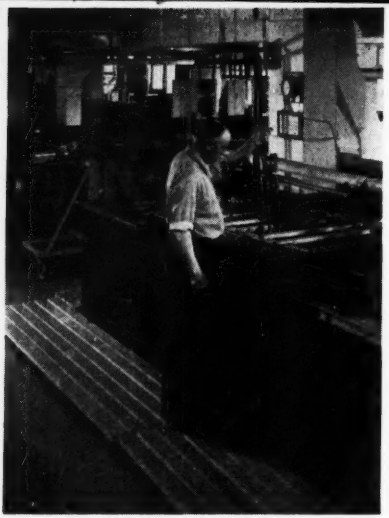
Special thermal economy panels developed by the Charles Wagner Litho Machinery Co. are said to be an important factor in the efficiency of rotary air Wagner ovens. The panels have an abnormally high resistance to heat transmission and a correspondingly low heat absorption. They permit rapid oven erection and facilitate oven expansion or revision, and aid materially in giving the oven adequate structure strength.

Millspaugh Joins Lacquer & Chemical Corporation Staff

According to a recent announcement, Mr. George Millspaugh, formerly with Seth Thomas Clock Company, Thomaston, Conn., has joined the Lacquer & Chemical Corporation, 214 Fortieth St., Brooklyn, N. Y., in the selling and servicing capacity.

His ten years experience in plating and metal-finishing departments are said to give him a clear insight into the problems which are usually encountered in the metal-finishing trade. This experience is backed up by a modern finishing and testing laboratory staffed by expert chemists and engineers.

Increase Production
Varied shapes and sizes more uniformly Finished
SEND SAMPLE TIME STUDY GLADLY GIVEN.
Packer-Matic Automatic
Polishing & Buffing Machines
Cut Hour Costs
Automatically — today's Method of Finishing
THE PACKER MACHINE CO.
MERIDEN, CONN.



New PLANT EQUIPMENT AND Materials

Larson Flat Polishing Attachment

A machine designed to surface flat or similar shaped parts, and for turning out perfectly flat finishes at a high production rate is now being marketed by C. B. Larson, 27 Tuscan Road, Maplewood, N. J. The construction of the unit is said to be sturdy enough for use in grinding, polishing, or buffing. The Larson attachment is arranged for use in connection with an ordinary polishing lathe or preferably in pairs for two lathes so that one operator can control the production of both spindle ends.

By using two attachments on one lathe, one operator can use two wheels set with different abrasive grains. According to the manufacturer, it is also possible for one operator to handle two lathes using four Larson flat polishing attachments, with four different grit combinations. The device can also be used as a single unit as shown in the illustration.

The oscillating spindle of the Larson flat polishing attachment is mounted on a balanced floating arm, which is equipped with an adequate depth-of-cut adjustment, as well as pressure control. The "floating" feature can be eliminated when grinding with hard wheels. The spindle and all rotating shafts are mounted in anti-friction roller or ball bearings.

The polishing spindle is driven by a three-groove V-sheave which is mounted on the original lathe spindle, in the same manner as a polishing wheel. The free end of the lathe spindle extends into the floating arm support bracket. The bracket is bolted to the lathe pedestal.

A reciprocating table of the unit is mounted on an individual heavy base and gear driven by a ¼ h.p. concealed motor. The work table onto which the fixtures are secured is equipped with a leveling adjustment. The stroke of the table is power driven and a foot treadle, combined with an electric switch, can be used to start and stop it and at the same time lower and raise the polishing wheel from the work. The combination of a rigidly supported reciprocating

Larson flat polishing attachment assembled with polishing lathe

table with a floating, balanced and oscillating polishing wheel is said to embody efficient engineering practice.

American Chemical Cartridges

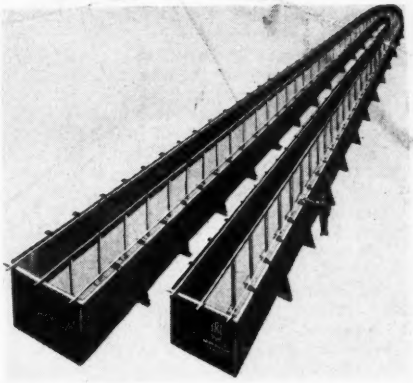
Three chemical cartridges which are quickly and easily interchangeable with the standard Type A dust cartridge now being supplied for the "American R1000 Respirator" are being marketed by American Optical Company, Southbridge, Mass. According to the manufacturer, this one unique respirator provides highly efficient protection against Type A dust or non-lethal concentrations of certain fumes or vapors.

One of the new chemical cartridges is designed for use against low concentrations of fumes and gases encountered in paint spraying and other light organic vapors. If desired, a protective cover can be supplied to retard plugging when the respirator is used in paint spraying. The second cartridge can be used for protection against low concentrations of acid gases, and the third against low concentrations of acid organic gases.

All three of the cartridges are alike in construction, differing only in the filtering element. They are said to be long-lived and thoroughly tested for uniform packing and high efficiency. A specially designed separator on the inlet side permits full use of the entire absorption medium. The wearer can breathe easily and is not subjected to objectionable odor.

Paramount SRL Tanks

The illustration herewith shows a tank which has been lined with Impervium-Sealed SRL by the Paramount Rubber Service, Inc., 1430 Rosedale Court, Detroit, Mich. This tank is said to be the largest ever built for plating purposes.



Paramount SRL Tank

The length overall is 162 ft. and is designed to hold a bright nickel solution.

Impervium-Sealed SRL is used to line the tank due to its immunity to oils, acids, alkalies, and other reagents.

The dielectric value of the lining is said to prevent electrolytic action between the tank and solution.

METALPREP
"Used First — Makes Your Paint Finish Last"
HAS BEEN USED ON MORE THAN TEN MILLION UNITS.
For all sheet metal surfaces. Removes rust rapidly and completely, etches the metal; makes paint adhere.
Write for Literature.
NEILSON CHEMICAL CO.
6564 BENSON ST. DETROIT, MICH.

THE ADIRONDACKS GORE MOUNTAIN CRYSTAL GARNET ORE
ABRASIVE GARNET
World's Standard for Over 60 Years
FOR
Abrasive Paper and Cloth
Grinding Wheels
Sand Blast
Lithographing
Non-Skid Surfaces
Wearing Surfaces
Ornamental Purposes
Minus 300 Mesh For Polishing
BARTON MINES CORPORATION
NORTH CREEK, WARREN COUNTY, N.Y.

Du Pont Moly-Black

A black electroplating process, to be known as the "Moly-Black" process, has been placed on the market by E. I. du Pont de Nemours & Company, Wilmington, Del. The process is described as producing lustrous, deep black electrodeposits. This process is based on a combination of molybdenum and nickel, which is available in plating salt form. The deposits obtained are said to be sufficiently black to escape color refraction under an intense beam of light in a dark room.

The Moly-Black Process operates at a high rate of deposition at low current densities. The throwing power of the solution is said to be higher than any other plating system and gives deposits of uniform thickness even in deep and irregular recesses.

An analysis of the deposit shows it to contain 45 per cent molybdenum and 10 per cent nickel, the balance being chiefly oxygen.

The products for which this type of process can be used to an advantage include electrical accessories, instrument dials, office furniture, lighting fixtures, flashlight cases, automotive hardware and trim, hinges, furniture hardware, and stoves. An important application is seen in optical instruments such as microscopes, cameras, and telescopes where a true black finish is necessary. It is applicable to bases of zinc; aluminum; cadmium electroplated on brass, iron, or steel; tin, either electroplated or hot-dipped; nickel; and steel or iron. An unusual characteristic of this black process is claimed in its ability to plate directly over aluminum prepared only by cleaning in an alkaline bath.

The Moly-Black coating is said to work well over any of the suggested base metals, particularly as a decorative finish for indoor use. For outdoor use, the black plate should be deposited over an undercoating of cadmium and then lacquered. Deposits produced by the new process are of low density with a maximum thickness of 0.002 inch.

Solvents Recovery Service

A recovery service for solvents and thinners from sludge, waste, washes, spoiled lacquers, and so on is now being made available through Solvents Recovery Service, Lister Ave. and Brown St., Newark, N. J., and also Hammond Chemical Service, 241 Brunswick St., Hammond, Ind. The equipment of these two companies is capable of handling quantities of materials from drums to tank cars.

Porter Ball and Pebble Mill

The H. K. Porter Company, Inc., 49th and Harrison Sts., Pittsburgh, Pa., recently placed on the market a ball and pebble mill. The mill is mounted on self-aligning roller bearings of high load capacity.

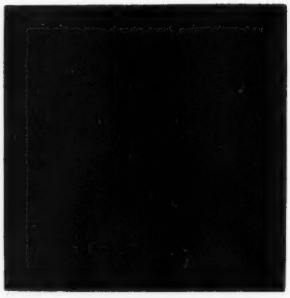
RUST-I-CIDE "50"

Cleans, etches, and prepares metal for a perfect finishing job.

It can help your product.

RUSTICIDE PRODUCTS CO.

3125 Perkins Ave. • Cleveland, Ohio

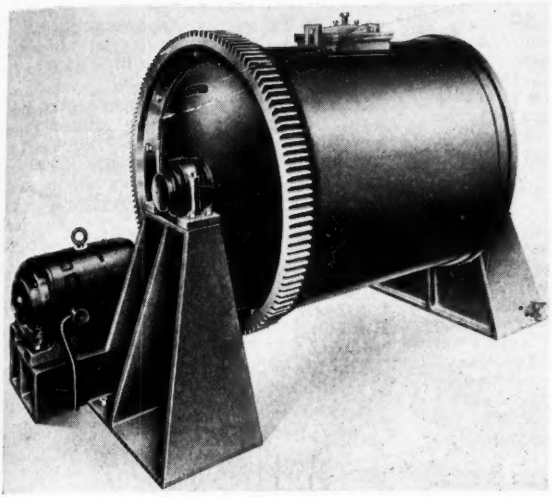


HARSHAW

QUALITY ANODES AND SALTS

THE HARSHAW CHEMICAL CO.

OFFICES: CLEVELAND, OHIO AND PRINCIPAL CITIES



Porter Ball and Pebble Mill

The Porter mill stands are of electrically welded steel construction. The motor stands are fabricated as an integral unit of the mill. This method of construction is said to avoid misalignment of motor drive.

All drives are designed to meet the service required and have been selected for high overhung load capacity to minimize bearing wear in the drives themselves.

Porter unlined mills are constructed of high carbon steel with a manganese content of 1.50 per cent to 2.00 per cent and having a tensile strength of over 100,000 P. S. I. and a Brinell hardness of between 200 and 250.

All mills, up to and including those 36 in. in diameter, are made with seamless formed dished heads of the same composition as the mill body.

All jacketed mills, whether lined or unlined, have the jacket extending over nearly 100 per cent of the mill surface. This feature is said to promote more rapid cooling or heating, as may be required, and provides for a more rigid control of temperature. Even distribution of heating and cooling media is obtained by means of babbles.

Polymeroid

A marproof hammered-effect finish designed especially for use on rough or porous metals, to be known as "Polymeroid," has been announced by Ault & Wiborg Corporation, 75 Varick St.,

WE RECOVER YOUR
SOLVENTS and THINNERS
from Sludge, Waste, Wash,
Spoiled Lacquers, etc.
AND SAVE YOU MONEY
Each shipment—one drum or a carload—receives PROPER and SEPARATE TREATMENT.
Write to:
SOLVENTS RECOVERY SERVICE, Inc.
LISTER AVE. & BROWN ST., NEWARK, N. J.
or
HAMMOND CHEMICAL SERVICE, Inc.
241 BRUNSWICK ST., HAMMOND, IND.

LIONITE
POLISHING GRAINS

1. CBT LIONITE
An etched grain built to withstand the shock and stress of rough work. Sizes 10-90 incl.

2. EPT LIONITE
An etched grain designed to prevent glazing. For operation where little self-dressing of the wheel occurs. Sizes 24-90 incl.

3. ST LIONITE
A finishing grain. Chemically treated to facilitate "greasing." Sizes 100-240 incl.

THE
General Abrasive Co.
NIAGARA FALLS, N. Y.

New York, N. Y. This finish is said to cover defects in the metal such as spot weld marks and file scratches.

Polymeroid is made with a Polymerin base and is said to retain the characteristics of heat resistance, durability and adhesion which are provided by Polymerin. Like Polymerin, Polymeroid can be baked on a short schedule.

The heat resistance of Polymeroid is said to make it adaptable for use on such products as boiler jackets, space heaters, water heater cabinets, and all types of heating appliances. Polymeroid's toughness and resistance are said to make it suitable for vending machines, office equipment, furniture, air-conditioning units, and other uses where durability is an important consideration.

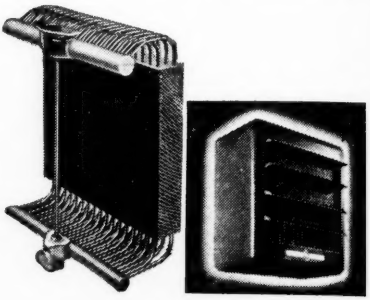
Although two operations are involved in its application, Polymeroid is said to be essentially a one-coat finish. The first coating is applied with a spray gun and while it is still wet, another coat is sprayed on. The second coat causes a hammered appearance which gives the effect of a rough finish.

The uniformity of the hammered pattern can be closely controlled. Polymeroid is available in all colors and can be furnished with a high gloss.

Herman Nelson Propeller-Fan Type hiJet Heater

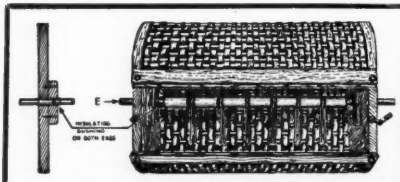
A Propeller-Fan Type hiJet Heater equipped with a patented "Stay Tube" has been placed on the market by The Herman Nelson Corporation, Moline, Illinois.

The Stay Tube has been built into the heating element between the supply and return headers to allow any entrained moisture, which might otherwise be carried over into the heater, to drain directly from the supply header to the return header without entering the other tubes of the heating element. If the entrained moisture is corrosive, it will first affect the Stay Tube which has been made four times as heavy as the other tubes in the heating element.



Herman Nelson Propeller-Fan Type hiJet Heater

The Herman Nelson Propeller - Fan Type hiJet Heater is said to provide heat where it is wanted and require both minimum space and fuel. Warm



KING PLATING BARRELS

PRODUCE CLEANER, FASTER, SMOOTHER PLATING

A wood woven cylinder adaptable to any barrel plating tank. There is no maintenance cost. Made in all diameters and lengths. Prices are exceptionally low. Write for illustrated folder.

Use them once—you'll use them always

JOHN KING
48 SPRINGFIELD ST., DAYTON, OHIO

Every BUFF Made to Your Order
Deliveries on Schedule

MIDWEST BUFFS
USE MIDWEST
E. 79th ST. & PLATT AVE. CLEVELAND OHIO

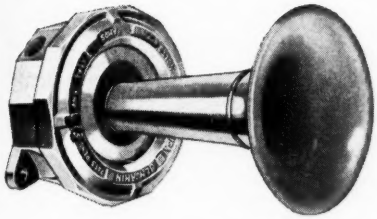
air is propelled downward at high velocity.

Simplicity of design and sturdy steel construction characterizes the cabinet. All corners are rounded. The finish is steel gray "Morocco." The attractive appearance of this type of heater is said to permit it to be used advantageously in commercial and industrial buildings of all types.

Benjamin Tone Signal

An efficient signal with low installation and maintenance cost to be known as the "Benjamin Howler" has been placed on the market by Benjamin Electric Mfg. Co., Des Plaines, Ill. Three outstanding characteristics are said to be tone, volume, and simplified assembly which is also said to permit the operating unit to be more quickly installed, serviced, or replaced.

Great sound penetration has been obtained in the Benjamin Howler by increasing the sound volume and the development of a distinctive tone that is said to give the signal greater audibility. The greater signal efficiency is said to be obtained without requiring any increase in current consumption.



Benjamin Tone Signal

As shown in the illustration, a simple turning of the threaded ring will detach the Howler from its base. The entire assembly plugs into a base socket in the same manner as an ordinary household appliance plugs into a wall outlet.

Estox Metaseal 494

A rust preventative and protective coating for steel, brass, and practically all metal products, to be known as "Metaseal 494," has been placed on the market by Estox Products Company, Westville P. O., Box 2954, New Haven, Connecticut.

Metaseal 494 may be applied by dipping, spraying, brushing, and is said to require no special equipment for its application. This material is said to seal clean metal products that have been cold rolled, forged, machined, or ground. When applied to fine machine parts, it may be necessary to remove Metaseal 494 before assembly. This is easily done in a bath of thinning solution and the regular industrial washing or cleaning in any standard cleaning solution will remove the material.

R-700

An unusual Rust Inhibitive.
Dries with lacquer speed.
Very flexible baking schedule.
Resists salt spray remarkably.
Very light in color.
Ideal vehicle for bronze powders and pastes.
Suggested wherever RUST is a production problem.
Remarkably adherent as primer under baked finishes.
Variations for special requirements available.
Our pamphlet will be gladly sent on request.

The Varnish Products Co.
5208 HARVARD AVENUE
CLEVELAND, OHIO

Oriental Rouge is the ideal rouge for obtaining a mirror-like finish on stainless steel, silver, gold and all other metals. Write for details.

Oriental Rouge Co., Inc.
Established 1901
66 Pine St. • Bridgeport, Conn.

Photoswitch Photoelectric Control

A photoelectric control to be known as the "Photoswitch" has been placed on the market by Photoswitch Incorporated, 21 Chestnut St., Cambridge, Mass. The Photoswitch equipment is recommended for counting, control, safeguards, signals and alarms, and inspection.

Photoswitch equipment is designed to give long service under severe operating conditions and should require no adjustment or replacement other than the normal replacement of the vacuum tube and lamp in the light source. These items are standard and may be obtained from any organization dealing with such equipment. The life of the vacuum tube is conservatively rated at 2,000 hours.

The light used in the light source, Type L30, for A.C. supply is a standard double filament 32-32 C.P. automobile headlight lamp operating on a voltage designed to insure long life.

The current consumption of Photoswitch is 30 watts, thus permitting installations to be made to the nearest light plug outlet.

Photoswitch comes equipped with a heavy relay capable of operating any signal, control or alarm up to 100 watts. If control of heavier current is desired, a power relay or contactor may be used.

Photoswitch Photoelectric Control

The various types of Photoswitch provide relay combinations suitable for all requirements of industrial control. Since the control is operated by interrupting the beam of light which has been projected from the light source to the "eye" of Photoswitch, the only requirement necessary is to determine the correct model.

Borolon
TRADE MARK

First quality aluminum oxide abrasive grain manufactured in our own electric furnace plant under strictest standards of quality and uniformity. Available in four types (CT, T, B, TB), each of which is most efficient for polishing work within its field of application. Write for Abrasive Grain Data Sheet No. 1 giving complete details. Samples sent of grain sizes you specify.

POLISHING GRAIN

ABRASIVE COMPANY
Division of Simonds Saw and Steel Company
Tacony & Fraley Streets · Philadelphia, Pa.
Chicago Branch: 1624 South Western Ave.

For a real good polishing job use
KEYSTONE EMERY
TURKISH — NAXOS — AMERICAN
KEYSTONE EMERY MILLS *Write for Sample* 4316 Paul St., Phila., Pa.

Paasche Automatic Airpainting Unit

An automatic airpainting unit with a 32-in. stroke air-operated oscillating arm has been placed on the market by Paasche Airbrush Co., 1910 Diversey Parkway, Chicago, Ill. This unit has been developed specifically for coating metal tile squares automatically. However, this piece of equipment is applicable to a wide variety of parts of a size similar to metal tiles.

A steady, continuous production is said to be readily obtained from this unit. Two automatic air guns automatically oscillate back and forth and apply the exact amount of material desired.

Paasche Automatic Airpainting Unit

The Paasche Automatic Airpainting Unit is 21 ft. long, 3 ft. wide, 2 ft. 6 in. high and the speed of the conveyor is variable from 2½ to 5 lineal feet per minute. The unit comes complete as illustrated, with ventilating duct, fireproof ventilating unit, pressure feed material tank, and enclosed coating station.

Annite

A highly active colloidal detergent which is said to clean solely by the physical process of emulsification to be known as "Annite" has been placed on the market by Quigley Company, Inc., 56 West 45th St., New York, N. Y. This material is readily adaptable for use in most mechanical cleaning devices because of its ability to remain in constant solution, permitting a regular and uniform supply to and from the machine onto the surface.

Annite is said to clean effectively in concentrations varying from ¼ oz. to 2 oz. per gallon. The material is non-inflammable and does not create a gas which might be inflammable or explosive. The material is said to be readily soluble in fresh or salt water at any temperature. A solution of Annite, according to the manufacturer, forms no sediment when allowed to stand without agitation. Annite is packed in 5, 25, 50, 100, 250, and 300 lb. containers, ready for use.

Lupomatic

Here is a *completely automatic* process for finishing all metals to a high grade lustre *at a saving of from* 60% *to* 92%.

Let us demonstrate *this money saving process to you gratis.*

Lupomatic Tumbling Mach. Co., Inc.
4511 Bullard Ave. New York, N. Y.

"INDIAN BRAND" TURKISH AND NAXOS EMERY
"HECCO BRAND" AMERICAN EMERY

"INDIAN BRAND" EMERY
absolutely uniform

Made only from select grades of ore — accurately graded and thoroughly cleaned. Prompt shipment on every order. Cuts cleaner — cuts faster. *Write for trial lot.*

HAMILTON EMERY & CORUNDUM CO. CHESTER • MASS. •

New Wrinkle Dipspray

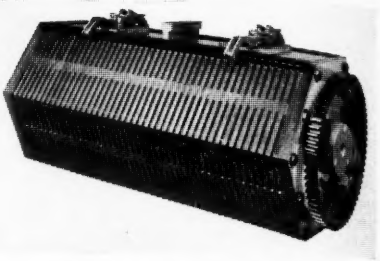
New Wrinkle, Inc., Mutual Home Bldg., Dayton, Ohio, licensors of wrinkle finishes, has recently developed a New Wrinkle dip-process of castings finishing to be known as "Dipspray." The Dipspray finishing process can be used in the foundry to aid in the elimination of costly mechanical castings finishing operations.

The New Wrinkle dip process of castings finishing coordinates the merits of wrinkle finishes with three simple steps. First, the casting is dipped in a thin solution of wrinkle finish. This dipping process covers the entire surface and seals all the pores. Second, the casting is placed on a slightly inclined, removable screen-covered rack so the surplus paint is collected in a tray which returns it to the dipping tank. Third, the wet casting surface is then sprayed.

During the baking operation which follows, the wrinkled effect takes place.

Crown Laminated Rubber Plating Cylinder

A plating cylinder made of molded



Crown Laminated Rubber Plating Cylinder

rubber sections rigidly held by steel support ribs on 4-inch centers has been placed on the market by Crown Rheostat & Supply Company, 1910 Maypole Ave., Chicago, Ill. The Crown Laminated Cylinder is constructed of ¾-inch sections which are said to give three times the amount of material to compensate for maximum wear. Slot openings are provided which allow for a maximum flow of solution through the cylinder. The slot openings can be adjusted down to 1/16 inch. The standard openings are ¼ inch, ⅛ inch, and 1/16 inch. Manual cleaning is said to be easier with the slot construction.

Check in DeWITT OPERATED HOTELS

In CLEVELAND it's
√ The HOLLENDEN

In COLUMBUS it's
√ The NEIL HOUSE

In AKRON it's
√ The MAYFLOWER

In JAMESTOWN, N. Y., it's
√ The Jamestown and
√ The SAMUELS

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Roxite Industrial Floor Material

A new flooring material for industrial application, to be known as "Roxite," has been placed on the market by Flexrock Company, 2300 Manning St., Phila-

Roxite Industrial Floor Material

delphia, Pa. Roxite is recommended for use with any floor patching material and is said to be an improvement

when used with any mastic floor patching material.

Roxite is "diabase" and "black quartz" quarried, crushed, and pulverized and graded for size. It is kiln dried and packed in 100-lb. waterproof bags. The Flexrock Company is making an offer to send a bag of Roxite free as an introduction to the first 1,000 companies requesting a bag and mentioning the use for which it is desired.

Manhattan Rubber Bushings for Grinding Wheels

A vibration dampener bushing or resilient mounting for portable grinders is said to be a new feature being incorporated in grinding wheels now being manufactured by The Manhattan Rubber Mfg. Division, Raybestos-Manhattan, Inc., Passaic, New Jersey.

Tests made by the manufacturer are said to show that through the use of V. D. B. (Vibration Dampener Bushing) mounting, which require no changes in existing equipment, increased grinding wheel life is obtained. Machine maintenance costs are said to be greatly reduced and a better grinding finish is obtained.

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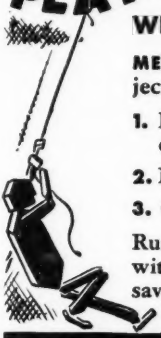
WITH METSO CLEANER



METSO helps you to cut rejects, and here's how.

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3. Complete free rinsing.

Run your baths for a week with Metso, and check the saving in time and money.

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1509 Spring Garden St. Philadelphia, Pa.

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THIS Opportunity Section is available for classified advertisements featuring equipment, employment, business opportunities, etc., in the industries devoted to the cleaning, plating, polishing and finishing of metals. For advertising rates and other information address:

PRODUCTS FINISHING
431 Main Street • Cincinnati, Ohio

FOR YOUR *Catalog* LIBRARY

To obtain copies of the catalogs listed here, indicate on the coupon the number of the item in which you are interested and mail as directed.

1. Anti-Corrosive Paints
An interesting leaflet describing the chemical actions of sub-oxide of lead in a paint film and how these can be used effectively in industrial maintenance problems is now being issued by Subox, Inc., 348 River Rd., North Arlington, New Jersey.

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2. New Wrinkle Dipspray
A castings finishing process known as "Dipspray" is described and illustrated in this catalog which is now being issued by New Wrinkle, Inc., Mutual Home Bldg., Dayton, Ohio.

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3. Triad-B
A very interesting and informative 4-page bulletin describing "Triad-B" All-Purpose Cleaning Compound is now being issued by Detroit Rex Products Co., 13017 Hillview Ave., Detroit, Michigan.

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4. Custom-Built Finishing Equipment
A 24-page catalog presenting various problems encountered in the cleaning of metal parts and describing the methods and machines used in the solution of these problems. N. Ransohoff, Inc., 212 W. 71st St., Cincinnati, Ohio.

5. H-B Thermometers
"Blue Book Part 5" is the title of a catalog now being issued by H-B Instrument Company, 2518 N. Broad St., Philadelphia, Pa., in which thermometers, hydrometers, and thermo-hydrometers are described.

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6. "Blacking" Rust Preventative
A 10-page catalog describing the Du-Lie Process, a method whereby steel parts can be colored with a permanent black finish. Du-Lite Chemical Co., Highland Ave., Middletown, Connecticut.

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7. Fire Fighting Equipment
"Don't Play with Fire" is the title of a catalog describing Lux portable extinguishers and the new Kidde-Lux which is now being issued by Walter Kidde & Company, Inc., 1031 West St., Bloomfield, New Jersey.

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8. Hovey Spray Equipment
A 4-page catalog describing and illustrating Hovey Spray painting guns and painting outfits is now being issued by Hovey Spray Equipment Co., 1509 Spring Garden St., Philadelphia, Pa.

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9. Woven Wood Plating Barrel
Folder describing many features of the King woven wood plating barrel. John King, 48 Springfield St., Dayton, Ohio.

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10. Ross Metal Decorating Oven
A complete description of the equipment for baking decorative coatings on metal is now being issued by J. O. Ross Engineering Corporation, 350 Madison Ave., New York City.

11. Centrifugal Dryer for Plated Work
A folder describing the Krieder Centrifugal Dryer for drying all types of plated work and lacquering small parts. Dellinger Manufacturing Company, 729 N. Prince St., Lancaster, Pennsylvania.

12. Spray Paint and Finishing Equipment
A most complete catalog describing and illustrating spray painting and finishing equipment manufactured by Binks Manufacturing Company, 3114 - 40 Carroll Ave., Chicago, Illinois.

13. Bonderizing
The Parker Process that holds paint to steel and resists rust, known as "Bonderizing" is described in this catalog now being issued by Parker Rust Proof Company, 2172 E. Milwaukee Ave., Detroit, Michigan.

14. Cadmium Plating
A catalog describing the Cadalyte Bright Dip Process of cadmium plating is now being issued by E. I. du Pont de Nemours & Company, Wilmington, Del.

15. Economical Degreasing
A series of leaflets covering practically every phase of metal degreasing are now being published by Detroit Rex Products Co., 13017 Hillview Ave., Detroit, Michigan.

16. "Tygon" for Process Equipment Linings
A 4-page folder describing "Tygon" as a lining material for process equipment. The U. S. Stoneware Co., Akron, Ohio.

17. Gas or Oil Fired Indirect Air Heater
An interesting illustrated bulletin describing the many new features of the new Despatch Indirect Air Heater. Despatch Oven Co., 622 S. E. Ninth St., Minneapolis, Minnesota.

18. Dust Collecting Systems
An attractive 24-page catalog has just been issued by The Kirk & Blum Mfg. Co., 2816 Spring Grove Ave., Cincinnati, Ohio, which illustrates and describes many K. & B. Dust Collecting Applications installed in numerous industries.

19. Corrosion Resistant Tank Lining
The application of "Resilon," a corrosion resistant tank lining material, is described in a 4-page folder now being issued by The U. S. Stoneware Co., Akron, Ohio.

20. All Purpose Stages
Aluminum all purpose stages for painters, decorators, construction and maintainence crews are described in a catalog now being issued by Aluminum Ladder Company, Tarentum, Pennsylvania.

21. Eye Protection Equipment
A completely illustrated 8-page bulletin describing a complete line of goggles and spectacles for industrial use. Mine Safety Appliances Company, Braddock, Thomas and Meade Sts., Pittsburgh, Pa.

22. Airway Ventilated Buffs
Cool cutting buffs for high speed buffing operations are illustrated and described in a 4-page folder now being distributed by Jackson Buff Corporation, 21-03 41st Ave., Long Island City, New York.

Print plainly in filling out coupon for literature.

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Index TO ADVERTISEMENTS

Abrasive Company 58
American Chemical Paint Co. 50

Barton Mines Corporation 53
Binks Manufacturing Co. 8

Cooper Co., D. C. 61

Detroit Rex Products Co. 29
DeWitt Hotels, Inc. 60
Du-Lite Chemical Co. 17

Egyptian Lacquer Mfg. Co. 6

General Abrasive Company, Inc. 55

Hamilton Emery & Corundum Co. 59
Harshaw Chemical Co., The 54
Hovey Spray Equipment Co. 61

International Nickel Company, Inc. 5

Jackson Buff Corporation 32-33
Juergens Co., Wm. A. 49

Keystone Emery Mills 58
King, John 56
Kirk & Blum Mfg. Co., The ..... Fourth Cover

Lupomatic Tumbling Machine Co. 59

Magnus Chemical Company 35
Mahon Company, The R. C. ..... Third Cover
Michigan Chrome Company 11
Midwest Buff Manufacturing Co. 56

Neilson Chemical Co. 53
Norton Company 4

Oakite Products, Inc. 1
Oriental Rouge Co., Inc. 57

Packer Machine Co., The 51
Parker Rust Proof Company 21
Pennsylvania Salt Manufacturing Co. 2-3
Philadelphia Quartz Company 61
Pulmosan Safety Equipment Corp. 37

Ransohoff, Inc., N. 23
Ronci Machine Co. 27
Roxalin Flexible Lacquer Co., Inc. ..... Second Cover
Rusticide Products Co. 54

Sievering, Inc., Philip 45
Skilsaw, Inc. 41
Solvents Recovery Service 55

Udylite Corporation, The 15
United Chromium Incorporated 25

Varnish Products Co., The 57

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